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THE

PRINCIPLES AND PRACTICE

OF

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GYNÆCOLOGY.

BY

THOMAS ADDIS EMMET, M.D.,
SURGEON TO THE WOMAN'S HOSPITAL OF THE STATE OF NEW YORK, ETC.

SECOND EDITION, THOROUGHLY REVISED.

WITH ONE HUNDRED AND THIRTY-THREE ILLUSTRATIONS.

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COLLINS, PRINTER.

MANY YEARS PROFESSOR OF CHEMISTRY IN THE UNIVERSITY OF VIRGINIA,

WHO DIED IN 1842:

AN HONEST MAN,

ESTEEMED BY ALL WHO KNEW HIM.

TO HIS EXAMPLE AND EARLY TRAINING I OWE MY SUCCESS IN LIFE;

IN YOUTH I AIMED TO MERIT HIS APPROBATION;

IN MANHOOD I HAVE STRIVEN TO BE WORTHY OF HIS GOOD NAME.

AND

This Book is also Dedicated

TO MY MANY FRIENDS IN THE PROFESSION,

WHO HAVE ATTENDED MY CLINICS AT THE WOMAN'S HOSPITAL:

TO THEM I FEEL IT SHALL BE WELCOME,

SINCE THEY WILL HAVE ALREADY PUT INTO PRACTICE MUCH THAT

IS NOW PRESENTED IN THIS NEW FORM

BY

PREFACE TO THE SECOND EDITION.

THE unusually rapid exhaustion of a large edition of this work, while flattering to the author as an evidence that his labors have proved acceptable, has in equal measure heightened his sense of responsibility. He has, therefore, endeavored to take full advantage of the opportunity afforded to him for its revision. Every page has received his earnest scrutiny; the criticisms of his reviewers have been carefully weighed; and while no marked increase has been made in the size of the volume, several portions have been rewritten and much new matter has been added. In this minute and thorough revision, the labor involved has been much greater than is perhaps apparent in the results, but it has been cheerfully expended in the hope of rendering the work more worthy of the favor which has been accorded to it by the profession.

89 MADISON AVENUE, NEW YORK.
February, 1880.

PREFACE TO THE FIRST EDITION.

THIS work is essentially a clinical digest. It includes the results of my individual experience, and aims to represent the actual state of gynæcological science and art.

For the past twenty-five years I have devoted myself to the study and treatment of the diseases of women, and have been continuously engaged in the service of the Woman's Hospital of the State of New York since its opening in 1854. From 1862 to 1872 I was the surgeon-in-chief, with entire medical control and sole responsibility in the treatment of its inmates.

In the beginning the capacity of the hospital did not exceed that of an ordinary sized dwelling. In 1862, and subsequently, through the efforts of Mr. A. R. Wetmore, Vice-President of the Board of Governors (in whose honor the structure is called the "Wetmore Pavilion"), means were secured for erecting a handsome edifice, especially adapted for its purpose. It was built under my personal supervision, organized by myself, and brought to a high state of prosperity before any change was made in its management. In 1872 there were added to the medical staff three other gentlemen whose eminence in gynæcology is well known. They shared with me the responsibility, and have done much to enlarge the reputation and usefulness of the institution, which, for several years, was the only hospital of this special character in the world. Up to the date of this reorganization about three-fourths of all the patients admitted had been under my care, and I had performed even a larger proportion of the surgical operations. To the enormous clinical advantages thus available have been added those of my private hospital, now in operation sixteen years, and those of an extensive consulting practice.

I have thought it proper to give this brief account of the clinical field from which such a large portion of the fruits herein presented have been gathered, in order to explain the individuality which the work may possess. In attempting to ascertain and formulate the laws which apply to diseases, and to analyze the results of treatment, I have compressed numerous histories and facts into a number of statistical tables, which present, in brief space, information that hundreds of pages would scarcely have sufficed to contain in detail. Their parallel, it is believed, is not to be found in the whole range of gynæcological literature, and if they unfold to others what I have aimed to put in them, I shall feel compensated for the labor they have involved. For two continuous years they kept me occupied in hours not required for professional work, and to the minutest detail they have been prepared by myself, for I felt that their value rested on their accuracy, which I could not have vouched for if their compilation had been committed to others.

In addition to my own experience, I have endeavored to record that of other authors whenever available, aiming always to include what I felt was useful, and to exclude rigorously what I knew to be erroneous in precept or practice, so that the work might faithfully mirror what I conceived to be the true aspect of gynæcology. It will be observed that, with the exception of the two plates taken from Savage's work and some of the instruments, all the illustrations are original, the drawings having been furnished by myself.

If I have omitted to give due credit to any one for priority in, or special contribution to, the elucidation of any subject, it has been through inadvertence, for I would account no man's labor as my own.

For obvious reasons I have been silent upon all diseases and conditions not peculiar to women; and I have not thought it necessary to insert formal prescriptions in the work. No man can prove successful as a gynæcologist who has not mastered the principles of medicine, and stored up experience in the general treatment of disease. The competent practitioner knows that prescriptions must be varied with each case; to the incompetent, ready-made formulæ are but a snare.

From the first page to the last I have cherished the same deep sense of responsibility that every conscientious physician must feel at the bedside of a patient whose life is in his hands; and in committing this work to my brethren I can truly say that it reflects the best part of a career that has not been idle or lacking in earnestness of purpose, and I trust, not spent in vain.

89 Madison Avenue, New York.
March, 1879.

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CORRIGENDA.

Page 139, 2d line from the top, *for* "pressing" *read* "passing."
" 174, 1st line, *for* "normal" *read* "abnormal."
" 387, 8th line from the bottom, *omit* "previous to the operation."
" 455, " " " " " *after* "laceration," *add* "on both sides."
" 482, 16th " " " " *for* "at" *read* "or."
" 630, 6th " " " " *for* "so as better to resist the," *read* "as to free the parts from."
" 634, 8th " " " " *for* "109," *read* "110."

THE PRINCIPLES AND PRACTICE

OF

GYNÆCOLOGY.

CHAPTER I.

THE RELATIONS OF CLIMATE, EDUCATION, AND SOCIAL CONDITIONS TO DEVELOPMENT.

Effects of the American climate upon longevity, nutrition, development, and generation—Early impressions on the nervous system are permanent, and are transmitted to descendants—Causes of imperfect development of young women—Active culture of the brain in the developing period incompatible with the normal growth and function of uterus and ovaries.

It has been asserted that all animals tend to deteriorate in this country; and, indeed, archæologists give abundant proof that successive races had peopled the American continent and perished before our own occupied it. In few portions of the globe has there been a like occurrence from natural causes; nations have overrun and assimilated the previous occupants of a country, but, when the land has once become populated, it has continued to be occupied. The cause of this tendency to deteriorate is as yet obscure, but it is not impossible that the peculiar nature of our climate has a share in it. When immigration to the United States shall have ceased, and the population shall have become more homogeneous, the problem will be somewhat simplified.

We certainly possess a most changeable climate; one which stimulates the nervous system, at the expense of nutrition, and renders us restless in both mind and body. Repose and quiet recreation, in a European sense, are unknown to the mass of our population. We develop early, but our lives are crossed by more than our share of dyspepsia, neuralgia, and other nervous disorders. The average degree of intelligence I judge to be greater in this than in any other country, on account of our heterogeneous origin. The scope of our education is as extensive as, if not more so than, that of our neighbors, but it is more superficial. Profundity is attained by comparatively few of us; for the same mental application on which a German, in his own land, would thrive, will, in this country, impair the physical condition, or result in some serious nervous disorder. There is no lack of perseverance amongst us, for we generally accomplish our undertakings; but the end is gained only at the expense of a disproportionate amount of wear and tear. We are, from necessity, eminently a practical people, and are always seeking the most direct method by which we may accomplish a purpose. In this peculiarity lie our hopes for the future.

We cannot escape wholly the evil effects of our climate, but we can, in a measure, by wise management and a judicious hygiene, protect the young girl from much that is evil in it, so that when she reaches maturity she may be less susceptible to disease, better able to perform her maternal duties, and capable of bringing forth an increased progeny. This can be accomplished only by allowing the full nervous force of the child to be directed towards perfecting its growth, and not by diverting it, at this critical period, in the interest of the intellectual faculties.

On the approach of puberty the nervous system becomes dominant in the female organization, and is as susceptible to external influences as is the barometer to atmospheric changes. But the simile is not applicable later on, since an impression for good or evil once made upon the nervous system, especially while in the adolescent period, is permanent, and, in all probability, never erased. It may lie dormant in the after-life of the individual, but will almost surely be transmitted to future generations.

At this period of life, whenever natural laws are disregarded, the young girl lays the foundation of a defective organization. She is rendered liable to local disease before marriage, to sterility afterwards, or to the life of an invalid from the birth of her first child; and her enfeebled constitution will be inherited by her offspring.

The progress of development is equal in the two sexes until the eleventh or twelfth year, but, after this, until old age, there is a wide divergence. The boy develops imperceptibly from youth to manhood; his generative function is perfected without special nervous disturbance, and even stimulates his growth; moreover, defects in his physical condition can be remedied in after-life to a much greater extent than is possible in the female. On the contrary, with her the transition to womanhood is rapid; her organs of generation acquire a preponderating influence in her complex organism, and her nervous system is fully taxed to secure and maintain that general harmony of function which constitutes health. The slightest defect in her sexual organs may, through the medium of the sympathetic nerves, produce functional derangement elsewhere. If the defect be a serious one, nutrition throughout the body may become impaired for the want of healthy nervous stimulus, and if the original mal-condition cannot be remedied, there may ensue a general decadence, physical and functional.

At the very dawn of womanhood the young girl begins to live an artificial life utterly inconsistent with a normal development. The "girl of the period" is made a woman before her time, by associating too much with her elders, and in diet, dress, habits, and tastes she becomes, at an early age, but a reflection of her older sisters. She may have acquired every accomplishment, and yet will have been kept in ignorance of the simplest feature of her organization and of the requirements for the preservation of her health. Her bloom is often as transient as that of a hot-house plant, where the flower has been forced by cultivation to an excess of development by stunting the growth of branches, and limiting the spread of its roots.

There are, fortunately, many exceptions to the rule, but society is so constituted that the most conscientious parent must yield to the force of fashion, and to-day almost every young girl in the land suffers more or less from a pernicious system of physical and mental training.

A girl scarcely enters her teens before custom requires a change in her mode of dress; her shoulder-straps and buttons are given up for a number of strings about her waist, and the additional weight of an increased length of skirt is added. She is unable to take the proper kind or necessary amount of exercise, even if she were not taught that it would be unladylike to make the attempt. Her waist is drawn into a shape little adapted to accommodate the organs placed there, and, as the abdominal and spinal muscles are seldom brought into play, they become atrophied. The viscera are thus compressed and displaced, and, as the full play of the abdominal wall and the descent of the diaphragm are interfered with, the venous blood is hindered in its return to the heart. This obstruction of the circulation, and the constipation from which women habitually suffer, lead to permanent dilatation of the pelvic veins, a fruitful source of disease, as we shall see hereafter.

As the change is made in the dress, from that of a child, custom demands protection by veil and gloves from the rays of the sun, and she soon becomes as blanched as a well-cultivated celery stalk. As the blood needs the chemical effect of sunlight acting directly on the skin, an anæmia is established. This state of the blood is a potent factor in the generation of all diseases depending on impaired nutrition, and entails conditions likely to baffle all medical effort at their removal during the menstrual life of the woman.

At the period of life when the young girl's whole nerve force is taxed for the full development of her organs of generation, this force is deflected by hard study, and, it may be, for the acquirement of some accomplishment, which in all probability will be forgotten or laid aside after marriage. She is subjected to the emotional influences of music and light literature, which, in a sensitive nervous system, are capable of arresting the development of the uterus and ovaries. The spirit of emulation which is encouraged in all schools has a deleterious influence on the nervous system of girls at any age, but particularly about the time of puberty; and those who are the least fitted to bear the strain always make the most effort. On looking over my case books I have been surprised to find the same statement repeated again and again, that the sufferer had taken the highest honors at some female school or college, and evinced no signs of weakness until the reaction took place after her return home.

I hold that it is not practicable to educate a girl by the same method found best for the boy, without entailing serious consequences, for the ovaries will always be arrested in their growth if the brain is forced. Even when the course of study is comparatively moderate, functional disturbances are of too frequent occurrence to admit a doubt as to the cause.

We are indebted to the late Dr. Edward H. Clarke,[1] of Boston, for two valuable treatises on this important subject, and already it is evident that excellent results are to spring from his good work. I have long appreciated the necessity for a radical change in the education of our children, and especially of the young girls of this country, but to overcome the evil has heretofore seemed, indeed, a hopeless task in face of prejudice and pecuniary interest. I not only fully indorse Dr. Clarke's views as far as he has gone, but my own experience leads me to believe that the evil is even more serious than he has represented.

I would advocate the highest grade of education for woman, in keeping with her means and station, but not the wrong method and the wrong period of life which have been settled upon for it.

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[1] Sex in Education, or a Fair Chance for the Girls, Boston, 1873.—The Building of a Brain, Boston, 1874.

To enable her to reach the highest physical development, the young girl in the better classes of society should pass the year before puberty and some two years afterwards free from all exciting influences. She should be a child as long as possible, and made to associate with children. Her dress, diet, and habits of life should be carefully looked after as if she were a child, and, above all, the habit of regularity should be enforced in all details. Her mind should be occupied by a very moderate amount of study, with frequent intervals during school hours, of a few moments each, and to be spent, when possible, in the open air. There should be no studying at night under any circumstances. Each menstrual period should be passed in the recumbent posture until the system becomes accustomed to the new order of things, and the habit of regularity is fully established. She should neither expose herself to cold nor over-exercise during the twenty-four hours before the expected period, and at the same time her lessons should be discontinued. After the menstrual function has become permanent, normal in character, and free from pain, she can begin to increase the number of her studies, but, afterwards, at the time of the molimen she should observe the same rule of rest, mental and physical. She should spend the same years in the completion of her education that are given by the young man to his collegiate course, for she will have reached a more suitable age, and, with ordinary care, be in better physical condition for the acquisition of knowledge. This will somewhat delay her entrance into society, but at the age of twenty-five, when she shall have acquired her growth and full physical development, she will be better fitted to become a wife. If custom would allow some approximation to this plan, I believe the women of our country would bear more children, be better able to discharge their maternal duties, and would preserve their youth and vigor many years longer.

Women of the poorer classes menstruate, as a rule, later than those in the upper walks of life, but reach their full physical development sooner. This is the natural result of a simpler mode of life, which enables a certain amount of privation and want to be more than counterbalanced by less waste of nerve force. A simple mode of life for the girl, therefore, fits the woman the better for marriage, and renders her more capable of discharging her duties as a mother.

CHAPTER II.

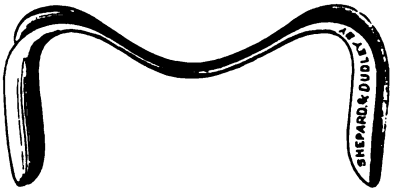
INSTRUMENTS USED IN EXAMINATIONS.

Specula: Sims's, Emmet's—Depressor—Tenacula—Sims's copper sound—Emmet's probe—Jenks's spiral sound—Sponge-holder—Long-nozzled syringe—Sims's elevator—Emmet's elevator—Applicator—Case of gynæcological instruments—Sponge tents—Method of preparing them—Emmet's uterine dilator, by sponge and by water—Rules for using sponge tents—Laminaria tents—Tupelo tents—Cornstalk tents.

THERE are various forms of specula for examining the vagina, and each has its advocates, the favorite instrument being the one to which the operator has become accustomed.

I have always used SIMS'S PERINEAL RETRACTOR, or my own instrument constructed on the same principle. Dr. Sims's instrument has been modified in various forms, and new ones have been invented on the same principle, with the view of dispensing with an assistant, but as yet nothing has been devised which can take its place. This instrument is so simple in design, and so perfectly does it fulfil every requirement, that it will probably never be superseded. The only objection to be advanced against it is that an assistant is required in using it. This, really, is an advantage in favor of the instrument, for an examination should always, if possible, be made in the presence of a third party. It is not necessary to have a trained assistant, for any one with ordinary intelligence can hold it sufficiently well, provided the operator himself understands how it should be held. It is much more important to know the proper position in which the patient should be placed for the examination. The instrument is generally made too heavy, and too straight in its central portion. When too heavy it soon fatigues the hand, even of one accustomed to it; and if made too straight it is apt to slip suddenly out of the vagina.

Fig. 1.



Sims's speculum.

As long as the sole use of the speculum was to bring the cervix into view, and to facilitate the passage of the porte-caustique in the treatment of supposed ulceration, the cylindrical speculum sufficed. With the advance of knowledge in the treatment of uterine disease, it became necessary to gain more space and light, and the cylindrical speculum has gradually been superseded by various instruments with expanding blades to open out the upper portion of the vagina. But nearly every speculum of the kind that I have seen is so long that it displaces the uterus more or less, and by continued use tends to dilate the upper portion of the vagina. I have known both retroversion and prolapse of the uterus to occur in patients from repeated use of a valvular speculum which stretched the upper portion of the passage. The amount of space and light obtained by any of these instruments is very small in comparison with what is afforded by Sims's speculum, and they are useless for all surgical procedures.

The older members of the profession who have become dexterous in the use of some special instrument, cannot be expected to change it for a new one, or to appreciate the necessity for doing so. But for the younger members it would be well to begin with Sims's speculum, if they wish to hold a position in the advance. Full justice, in the light of our present knowledge, cannot be done in the treatment of uterine disease by any other instrument than this perineal retractor, or some other based on the same principle, and, like it, capable of exposing the whole vagina.

In a single generation, the use of this instrument has advanced the knowledge and treatment of the diseases, and especially the injuries, of woman from profound ignorance to a front rank, if, indeed, not beyond that of any other branch of surgery.

My own speculum, or RETRACTOR,[1] has been in use since 1867. When properly adjusted it is self-retaining, and in many cases can be used without the aid of an assistant. I have frequently used it in long surgical operations; and, if we had not Sims's instrument, I would recommend it as fulfilling every condition, since it acts on the same principle. To use it the patient is placed on her left side in Sims's position, and the instrument is introduced into the vagina by means of the index finger of the right hand, and passed behind the cervix, while at the same time the perineum is firmly pressed back by placing the thumb of the same hand in front of the screw at *F*. As the instrument is held in this position, the screw *B* is turned sufficiently to revolve the vaginal portion into the hollow of the sacrum, and at the same time the fenestrated blade becomes imbedded in the soft parts on the upper buttock, the perineum is retracted. The screw *A* is for securing the blade at any angle that may be necessary. By means of the screw *D* the upper half of the vaginal portion is elevated, and with it the right, or upper, labium. The instrument is held in place by the blade on the buttock, but, as this surface is more or less movable, it sometimes allows the other end of the instrument to sag, and the os uteri cannot always be brought into view unless the patient is placed on a plane inclined from the operator. This difficulty, however, is easily overcome by resting the finger of an assistant on the upper part of the blade, and I have frequently made the patient hold it with a finger of the left hand, which, as in Sims's position, is always drawn out from under her, and lies over her back.

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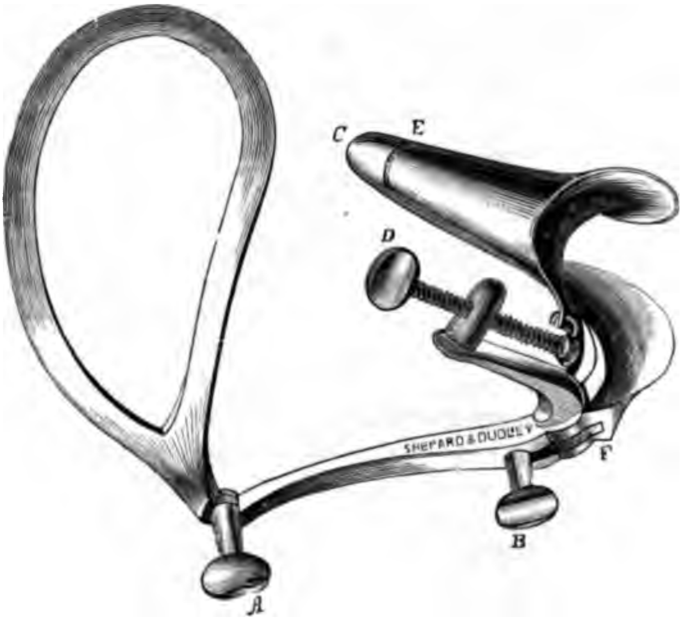
[1] This instrument has been credited to Weiss by Dr. Barnes, and to Mr. Spencer Wells by Dr. Churchill. But I presented the instrument to Mr. Wells during his visit to this country, and Weiss doubtless afterwards copied it.

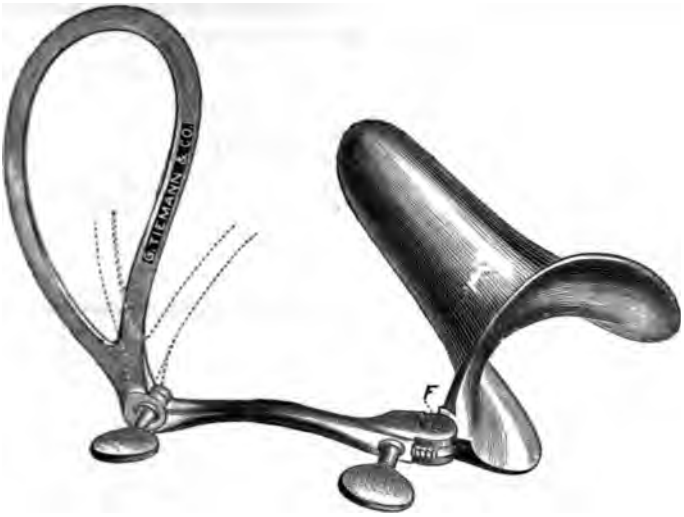
Fig. 2.



Emmet's perineal retractor—double blade.

Since learning the facility with which this speculum can be held by the patient, or by an untrained assistant, Tiemann & Co. have reproduced the original instrument made by them for me many years ago. It is a single blade somewhat wider than the ordinary Sims's speculum, and it thus makes a very satisfactory instrument for office practice in the treatment of women who have borne children. By dispensing with the screw and upper blade, shown in Fig. 2, the cost of the instrument is greatly reduced. This single blade is, however, too large to be used with unmarried women, which was not the case always with the other instrument when the blades were not separated. But this objection for some cases is applicable to every other instrument in use except to a small-size Sims's speculum. I have recommended a larger-size blade for use in surgical operations when the vagina will be relaxed from the effects of the anæsthetic. Blades of different sizes can be made to hook on or be detached from the pivot at *F*, Fig. 3.

Fig. 3.

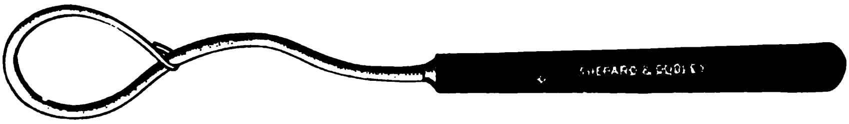


Emmet's perineal retractor—single blade.

The DEPRESSOR is used when needed to push back the anterior wall of the vagina sufficiently to bring the cervix into view. It has been made like a spatula and in other forms; but the original instrument, which was made impromptu from a large silver-plated copper sound, cannot be improved upon.

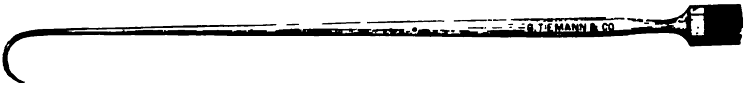
The TENACULUM is necessary for seizing the cervix and bringing it into view, and for steadying the uterus while examining or making applications to the canal. I had Sims's instrument reduced in size, made much lighter, and the shape of the hook changed from a gradual curve to one coming off from the shaft at nearly a right angle, with only a slight curve at the point (Fig. 6). Both instruments are generally made too blunt, whereas the point should be as sharp and tapering as a needle. The larger tenaculum, introduced by Dr. Sims, answers for making examinations, and is often more useful on account of its strength and size, but the smaller instrument is better for seizing the portions of tissue to be removed in operations.

Fig. 4.



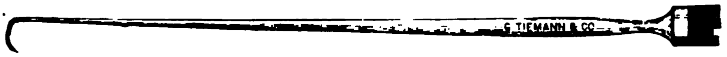
Sims's depressor.

Fig. 5.



Sims's tenaculum.

Fig. 6.

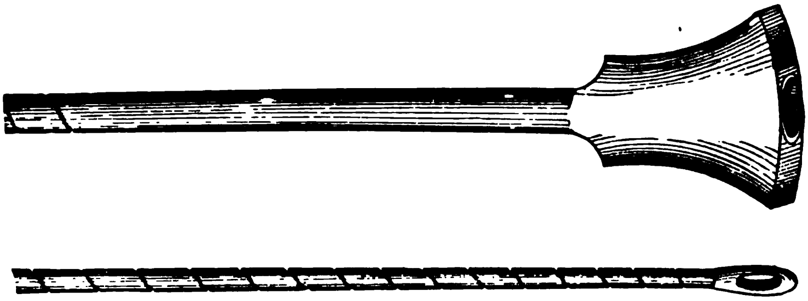


Emmet's tenaculum.

Dr. Sims, many years ago, had Simpson's sound made of copper, and reduced somewhat in size. This was, indeed, a great improvement, since it permitted the curve of the instrument to be changed whenever necessary. But I found it possible to be misled by it as to the actual position of the uterus, for, when curved in accordance with the impression suggested by a digital examination, the uterus would sometimes conform itself to the sound. I therefore adopted the surgeon's silver probe, made longer and provided with a handle. I use the instrument simply to feel with, as it were, when the parts are beyond the reach of my finger, and, as it is too delicate to move the uterus, it cannot mislead or do harm.

Dr. Jenks, of Chicago, has introduced a uterine sound in which he utilizes the principle of Otis's spiral catheter for the male. I have found it an invaluable instrument, under certain circumstances, for ascertaining accurately the depth of the uterine canal.

Fig. 7.



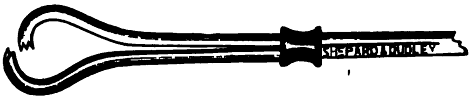
Jenks's spiral sound.

The above illustration gives the size of two sections, the middle one not being shown, of the instrument I have in use. It is one made large for the purpose of measuring the canal, where the depth was due to a fibrous growth, and, in several instances, its use has determined the diagnosis between an ovarian and fibro-cystic tumor where the ordinary probe could not be passed to the fundus. It was made open at both ends to clean it, by passing a stream of hot water through it, and to be used, when necessary, as a female catheter. I have recommended Tiemann & Co. to make the instrument in two sections, so that one could slide within the other, and, when screwed together, to be used as a catheter for obstetrical practice. The advantage of its length and form would be that it could be introduced into the bladder when neither a soft rubber nor a silver male catheter could be passed.

A piece of whalebone about eight or nine inches in length, with a rough thread cut on the end like a gun screw, is a useful device of Dr. Sims for holding the cotton with which to swab out the vagina. The cotton, which is better adapted to the purpose than a piece of sponge, is twisted on to the whalebone, from which it is easily removed by reversing the twist. This stick is also very useful, as we shall see, in tamponing the vagina.

A number of Sims's SPONGE-HOLDERS are needed for surgical purposes, and for removing blood from the vagina in case of accidental hemorrhage after an examination. They should be made of a single piece of iron, and galvanized, or copper-plated, which is better; for if made with a bone or wood handle this soon becomes cracked from being placed in hot water, and separates from the metal.

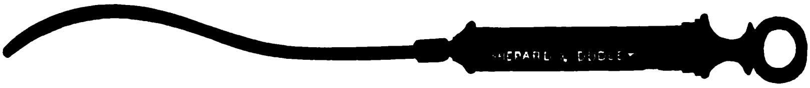
Fig. 8.



Sims's sponge-holder.

To remove the mucous discharge from the uterine canal I use a LONG-NOZZLED SYRINGE (Fig. 9) made of hard rubber, which I bend to the proper shape, for introduction within the uterus, by heating it in the flame of a spirit lamp. To prevent the rubber from burning it is necessary to grease the nozzle well before heating it. The proper curve may be retained by plunging the instrument into cold water.

Fig. 9.



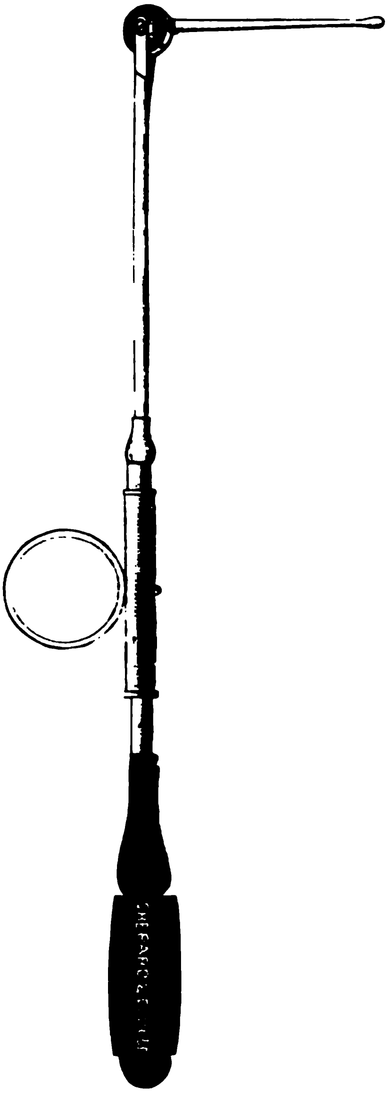
Long-nozzled syringe.

Some sixteen years ago, Dr. Sims devised THE ELEVATOR, an ingenious instrument, for replacing a retroverted uterus (Fig. 10). The stem-shaped portion is introduced into the canal, when, by depressing the instrument and gently pushing it backwards into the posterior cul-de-sac, the cervix is made to pass under and beyond the fundus, and the organ becomes anteverted. This is a vast improvement upon the old plan of replacing the uterus with Simpson's sound, a procedure always attended with risk, even in the hands of an expert, for the point touches the fundus of the uterus and may perforate it. Moreover, we cannot always estimate the degree of force we are using, nor whether adhesions exist. With Dr. Sims's instrument the fundus is not reached, the uterus rests on the bulb at the base of the stem, and, with ordinary care, the slightest resistance can be appreciated. The only objection to the instrument is in using it in a narrow vagina, or a shallow posterior cul-de-sac, when it cannot be withdrawn from the uterine canal without again partially retroverting the organ.

This difficulty led me to have the uterine, or stem, portion divided, like a finger, into three phalanges or segments, movable from the straight position only in a forward direction (Fig. 11). By pressure on the shaft backward, the three segments are brought into a straight line, and the stem is then as rigid as that of Dr. Sims's elevator.

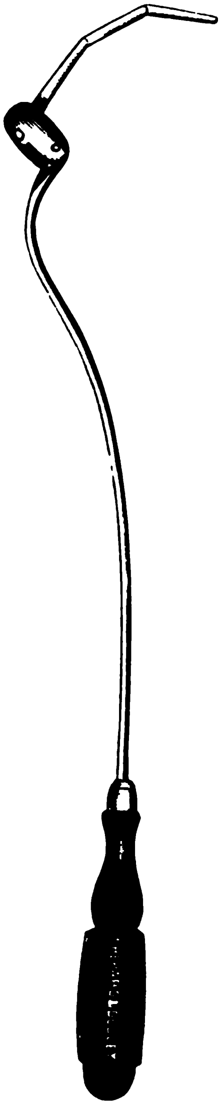
It is used in the same manner, but the joints allow the portion in the uterine canal to be withdrawn without disturbing the corrected position of the uterus.

Fig. 10.



Sims's elevator (half size).

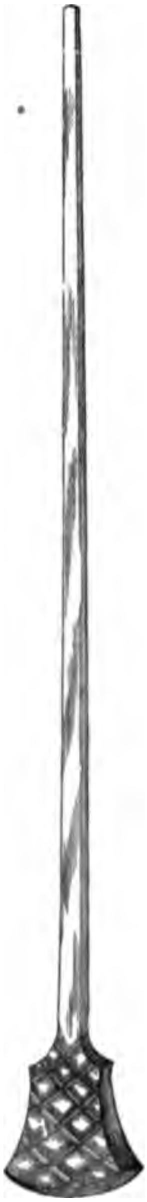
Fig. 11.



Emmet's elevator (half size).

I have for years used Sims's elevator for estimating the relation of the uterus to an abdominal growth. A stylet runs through the instrument, and by a spring in the handle is made to slip into a series of holes in the bulb, so that the uterine portion can be locked at any angle. When introduced into the uterus and thus secured, the organ is entirely under the control of the operator. On moving the uterus in any direction by means of this instrument in one hand, we are able to judge of its relation with an abdominal tumor by placing the other hand upon the abdomen.

Fig. 12.



Emmet's applicator.

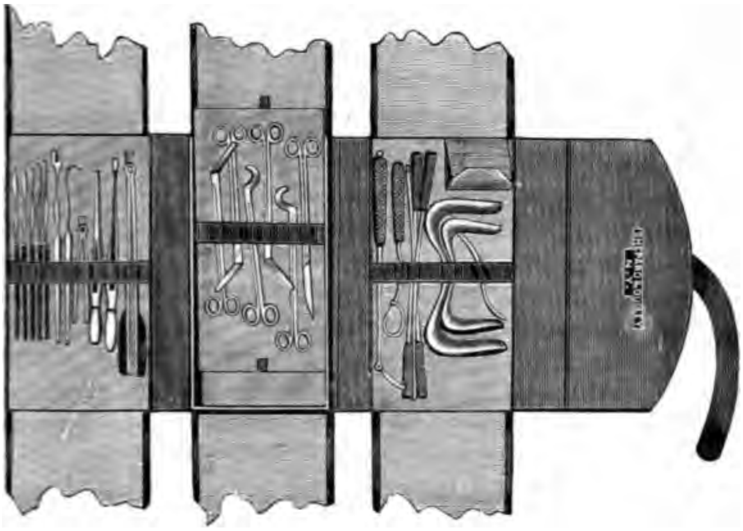
The APPLICATOR (Fig. 12) is designed for introducing medicated fluids within the canal, in the treatment of uterine disease, and for arresting any accidental bleeding that may follow an examination. This instrument, as well as the probe, should be made of pure silver, and not of coin metal, or it will soon break from a frequent changing of the curve. As generally made and sold in the shops it is almost useless, as it is too long, and, being of the same thickness throughout, it bends so readily upon itself that it is with difficulty made to reach the fundus. It is sometimes made of German silver to which a portion of coin silver is welded, but this is objectionable also, as the two soon separate. The instrument is sometimes inserted for so short a distance into a wooden handle, that it is easily broken. It should be made from a rod of silver about one-eighth of an inch square, gradually tapering to half this width and thickness. The handle need not be larger than that of a grooved director, which is of sufficient size to be grasped between the thumb and forefinger, and the whole instrument can be made in one piece, about eight inches long. The probe should also be made in one piece, but much lighter, and gradually tapering from the handle ; the edges should be rounded off for half the length, and terminate in a button or bulb.

The cut (Fig. 13) on the next page represents a convenient and compact case made to contain the instruments which have been described, and others to be spoken of later. In the middle compartment are the scissors and other instruments which would be injured by being twisted in the rolling or folding of a case. Beneath these is space for the speculum and sponge-holders.

Sponge-tents are indispensable for dilating the uterine os and cervix, to enable us to detect the source of a hemorrhage, and to ascertain the position and size of any growth within the canal. They are also very serviceable in the treatment of certain conditions which will be referred to hereafter. Their use may be followed by serious consequences, owing to the want of proper care in their preparation, to a lack of judgment as to when the condition of the patient justifies their introduction, and to neglect in caring for the patient afterwards.

Their proper preparation is of sufficient importance to warrant the surgeon charging himself with that duty, and if this be impossible, he must leave it only to a competent and trustworthy person. The sponges should be carefully selected, and of rather a coarse quality, but free from sand and shells. They must be thoroughly washed with soap and hot water, the impurities picked out as far as possible, and then exposed to the action of the sun for a day or two. They are next cut up into cone-shaped pieces of different sizes, which are trimmed of their inner edges, but, as far as possible the outer portion should be preserved, as it offers a smoother surface upon which to wind the cord. The pieces should again be thoroughly washed in hot water to which a little of Squibb's impure carbolic acid has been added, and again carefully picked over, to remove any sand or shell

Fig. 13.



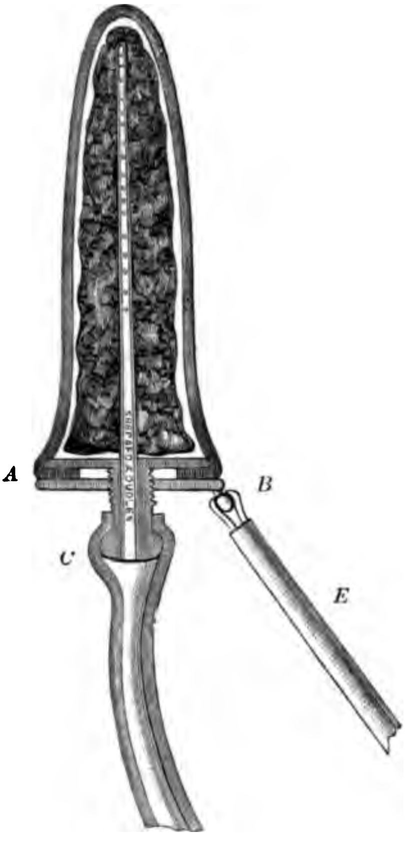
Gynæcological case.

which can be more easily felt in the small pieces. The gum Arabic should be of the best quality, and the solution a saturated one. An instrument with a handle, like a straight awl (a broken tenaculum answers very well for the purpose, but it should be a little longer than the sponge), is passed through the sponge, which is then dipped into the solution and wrapped. The cord should be a strong one, but not large, and the wrapping must be begun by two half hitches at the larger end, so that it will not slip. The tighter the cord is drawn the better, and it should be evenly applied throughout, and at the end finished by half hitches. Not only should the sponge be compressed in its diameter, but also shortened as much as possible by crowding it down on the staff as it is being wrapped. This is done in order that the tents may not only dilate, but also expand in length, and advance beyond the point to which they are introduced. When the cord has been secured, the staff is withdrawn, and the tents dried rapidly before a hot fire or in the sun. When nearly dry, but still pliant, a number of them should be bent in different curves, and allowed to harden in the form given them. After they have become thoroughly dry the cord may be removed, and they are then ready for use. They require no wax, and are preferable without it, since the coating would occupy a space which otherwise would admit a larger tent. The roughened surface left after removing the cord is an advantage in preventing the tent from slipping out, and it does not injure the lining membrane since it softens as soon as it comes in contact with any moisture.

A great deal of irritation, and frequently inflammation, is caused by forcing a straight tent into a curved canal. It is, therefore, essential, as I have taught for ten years or more, to have the tents conform to the curve of the canal. This is ascertained by means of the probe, bent and carefully introduced until the exact curve is obtained. If the proper tent is then selected, it can be introduced without difficulty, and will cause but little irritation.

Fig. 14 represents a SPONGE DILATOR which I designed in 1870, and have found useful for making a final dilatation of the uterine canal previous to performing an operation. Through a disk of hard rubber passes a brass tube, which is perforated by a number of small holes, and open at each extremity. This tube is passed through the centre of a sponge tent of suitable size, the whole being covered by a thin India-rubber cot or bag, of which the mouth is stretched over the edges of the disk and the free edge of the cot which has been drawn over the disk is then secured between the under side of the disk and the brass plate *A B*. The plate *A B* has attached to it, on one side at *B*, a knob which can be grasped by a pair of forceps, the blades of which are closed by sliding forward the canula *E*. When the knob *B* is held by the forceps, a ball-and-socket joint is formed, which will admit of motion in any direction. Over the bulb at *C* is slipped a piece of India-rubber tubing, a foot or more in length, through which water is introduced for swelling up the tent, and at the end of the tube is a stopcock. To the other side of the stopcock a Davidson's syringe may be attached, or, what I have found to answer better, a thin India-rubber bag, such as are used for pessaries, with tube and stopcock. The dilator is introduced by steadying the cervix with a tenaculum in one hand, and by holding the forceps and tubing in the other hand the proper direction can be given to the instrument. When it has been introduced within the canal to the proper depth, a small amount of water is to be thrown in before removing the forceps. As the tube in the centre of the sponge is open at its extremity and its sides perforated, the water will make its exit at the upper portion, and dilatation will extend from above downward, so that the instrument cannot slip out. The sponge is sufficiently dilated in a few moments to cause it to be retained, and the forceps may then be removed by sliding back the canula. I direct the patient to lie in bed on her back, and to place on the abdomen an air bag containing water, which is made to flow into the dilator by occasionally compressing the bag with the hand.

Fig. 14.



Emmet's sponge dilator.

I generally leave the dilator in place for twelve hours, unless there should exist some special reason for a more rapid dilatation. The instrument is easily withdrawn, while the patient is on her back, by removing the bag, and turning the stopcock for the escape of water from the sponge. The forceps are then passed along the index finger into the vagina and made to catch the knob of the instrument, when it can be withdrawn, the finger being held against the cervix to guard against displacing the uterus.

The chief advantage of this dilator is that it greatly reduces the chance of blood-poisoning, a danger which cannot be always avoided in using uncovered sponges. Fortunately, when blood-poisoning does occur, it is seldom from the use of a single tent, and, if the precaution be taken (which I always insist upon) to wash out the canal thoroughly whenever a tent is removed, we will greatly lessen the risk. Another advantage of the dilator is that it does not injure the uterine walls, and consequently we have no bleeding from the canal after its use. Moreover, with this dilator the force is not concentrated at any one point, but is equable throughout.

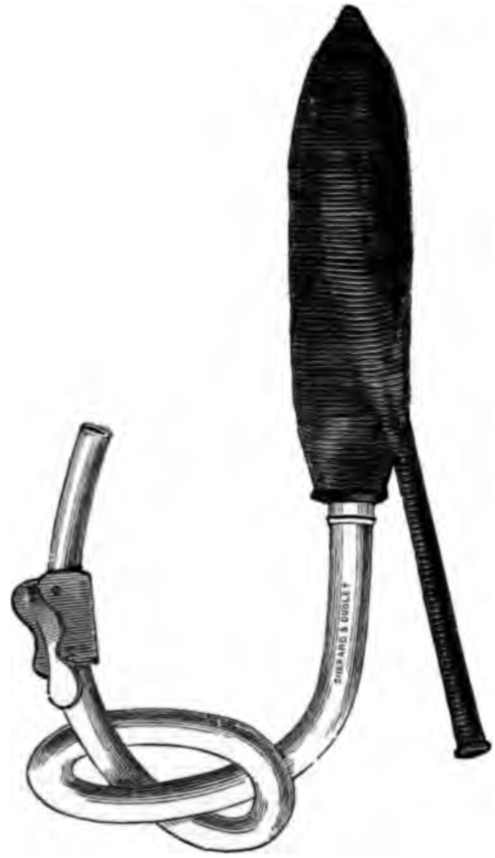
Its disadvantages are that with it we can seldom dilate to the same extent as can be done with the tent alone. The resistance offered by the uterine tissue yields to the steady pressure of the sponge, but the elasticity of the India-rubber bag itself will to some extent counteract the dilating force. We are therefore obliged to use a cot much larger than the sponge, which will occupy an additional space, and this makes it necessary that the canal should be somewhat patulous before the dilator can be introduced.

I have used the instrument several times for rapid dilatation, and it answers the purpose very well, but, unless this is necessary, the more gradual process is to be recommended, as attended with less risk; of course, this does not apply to obstetrical practice. In rapid dilatation, however, it acts at first like any other water bag, but, as soon as the sponge has had time to expand, it absorbs the water and the pressure then becomes uniform. With other dilators, where water is the medium employed, the power is much greater, but a large portion of the force is always expended in the vagina, and, if the parts above do not readily yield, the bag becomes ruptured below. This is the chief objection to Barnes's dilator; a large portion of the bag becomes expanded in the vagina and will frequently burst there, unless there is sufficient space in the uterine cavity for its expansion in that direction.

This difficulty I have overcome by an instrument, THE WATER DILATOR, which can be introduced with the greatest facility, and held in position until dilated sufficiently above to keep it from slipping out of the canal. (Fig. 15.)

The small opening at the end of an India-rubber cot or bag is stretched over a hard rubber button, and held from slipping by being compressed between it and a disk, which is screwed into position.

Fig. 15.



Emmet's water dilator.

This cot is entered at the side, and below, by a tube which is closed at the upper end, and lies free in the bag, reaching as far as the upper point of the dilator. Through this tube a copper sound is introduced for the purpose of carrying the bag to the fundus. If necessary to facilitate its introduction, the sound can be bent in any direction, and the bag will, of course, conform to the same.

A piece of tubing of sufficient length to project beyond the vagina is attached to the button, and the nozzle of a Davidson's syringe is to be inserted into the other end. The top of the bag is to be held at the fundus by means of the sound, throughout the operation, or until a sufficient quantity of water has been thrown in to dilate it enough to be retained.

On the tubing is shown a simple clamp by which it can be firmly compressed. After fully distending the bag, and then compressing the tube by means of the clamp, the dilating force can be maintained continuously. At short intervals water is thrown in, and by degrees the uterus can be fully dilated as rapidly, if not even with greater ease, than with any other dilator. The great objection to this instrument is, like all others of soft rubber, that, unless recently made, they cannot be relied upon to stand a continuous strain without bursting. Yet, under any circumstances, this will bear far more than most others, because it is supported so uniformly by the uterine walls. It might be made of larger sizes for obstetrical purposes; and would answer exceedingly well for bringing on labor by rapid dilatation of the os uteri.

I have found it often very serviceable for arresting hemorrhage, particularly when due to soft growths, or to some diseased condition of the canal. It is of great value, after a tent has been used, to increase the dilatation at the time of operating for the removal of an intra-uterine tumor. Ten or fifteen minutes will often be sufficient to effect the necessary dilatation for purposes of exploration, but, as already stated, rapid dilatation should never be employed unless the case is urgent. If pregnancy exists, and a tent has been already used, or if there should be hemorrhage, there will be less risk from rapid dilatation. Under other circumstances, it is always attended with the danger of exciting inflammation.

Rules for the Use of Sponge Tents.—Before introducing a sponge tent for the purpose of dilating the uterine canal, it is well to have the bowels moved, and the patient should not be suffering from the effects of recent cold or any other special disorder. But more important than all, *a tent should never be passed into the canal if there has been an attack of cellulitis so recent that a vestige of thickening remains, or if the slightest tenderness on pressure can be detected by the finger in any part of the vagina.*

The operator who does not inform himself fully as to the condition of the patient in regard to any old cellulitis that may have existed, and as to the fitness of the patient for the operation, is criminal in his neglect, for, notwithstanding all the care that the most conscientious man may be able to exercise, bad results will sometimes follow the use of tents.

When the uterine canal is curved, a tent must be selected of a similar curve; and it is better to use several small tents than a single very large one, selecting one of a size that can be easily inserted, and then passing around this several thinner ones. Each tent should have a string attached by a double half hitch to its base, and, before its introduction, it should be dipped into glycerine, which will cause it to expand rapidly from the moisture furnished, while the agent is useful as a disinfectant. I make it a rule to place the patient in bed immediately, applying heat by some convenient means to the. feet, and, if the weather is cool, the sheets should be previously warmed. I never allow a patient, under any circumstances, to get out of bed, the bladder must be emptied when required by means of a catheter, or into a bed-pan. The greatest care must be exercised to guard against exposure to cold; perfect rest must be observed, and an opiate enema administered, should there be pain enough to call for an anodyne. When the pain is severe, and is not relieved by the opiate, or if a sensation of chilliness is experienced, it is better to remove the tent, and defer the dilatation to some future time. The nurse should give a large vaginal injection of warm water night and morning, adding a little carbolic acid to it, if there should be much discharge. The tent should not be allowed to remain in the uterine canal longer than twenty hours when used for diagnostic purposes.

The tent is to be removed while the patient lies upon the back, by holding the string in one hand, and making pressure downward and backward with the index finger of the other hand against that portion of it nearest to the cervix. If, however, the tent is a large one, it is best first to bring the cervix into view with Sims's speculum, when it may be seized with a pair of strong forceps and twisted upon itself until it becomes loosened; but, before it is entirely removed from the canal, the twist should be reversed, so that the sponge in expanding may again take up the fluid which was expressed from it.

To facilitate a diagnosis of the condition within the uterine cavity, it is necessary to place the patient on her back, with the lower extremities drawn up. Then, as the index finger of one hand is passed within the uterus, the other hand is placed over the abdomen to steady the organ, and at the same time to gently press it low enough into the pelvis for the finger to reach the fundus, unless the uterus is too much enlarged. After the examination has been made, the uterus must again be lifted by the finger to its proper place in the pelvis, and its cavity well washed out with warm water. This can be done with the patient lying on her back, a bed-pan being placed under her, and the nozzle of Davidson's syringe being passed into the uterine cavity; or, the patient may be placed on the left side, the speculum introduced, and the water thrown in and withdrawn by means of the long curved-nozzle syringe, shown in Fig. 9. If the uterus has been well dilated, the best position for washing it out is on the back, as this permits of it being thoroughly done. But to facilitate the escape of water and clots from the uterine canal, the index finger of one hand should be inserted just within the os, and the perineum kept well retracted by pressure with the back of the hand. After the injection has been given the dilator or another tent can be introduced, if necessary, the patient being again placed in bed and treated in the same manner as during the first dilatation. If the uterus is not to be again dilated, I make it a rule to apply Churchill's strong tincture of iodine freely to the cavity, either by means of the applicator, or by injecting a small quantity to the fundus from a long-nozzled syringe. The iodine causes prompt contraction of the uterus, and is also a good disinfectant; afterwards, the patient should be replaced in bed, and kept quiet until the next day.

There are many in the profession who ridicule the necessity for so much caution as I have advised, but I have had some unhappy experiences in times past, which might have been guarded against with my present knowledge. For years I have followed the above plan, and in no instance now will I introduce a tent in my office and allow the patient to return home. As a rule, I insist upon the patient remaining for a time in my private hospital, and only consent to conduct the treatment in her own house when I feel that my directions will be fully carried out. Every year's experience but the more confirms me in the correctness of my views in reference to the use and dangers of tents.

The sponge tent is used not only for diagnostic purpose, but is a most valuable aid in treating certain forms of uterine disease, as will be shown hereafter. Almost every practitioner has at some time witnessed the bad effects and even disastrous results following the use of sponge tents; more care, therefore, is called for in their use or one of the valuable agents in uterine surgery will eventually fall into obloquy. Sometimes a comparatively slight irritation by a tent will provoke an attack of cellulitis or blood-poisoning; and at other times a most remarkable degree of tolerance of them is evinced.

The latter condition was shown in the case of a fashionable lady in this city who was under my care for frequent hemorrhage. It was necessary to dilate the uterus, and as she resided quite near me, she came to my office for the purpose of having me introduce a tent, one about three inches in length being used. As a precaution I accompanied her to the carriage, impressing on her the necessity for carrying out my directions to remain quietly in bed, and I saw her drive in the direction of her residence. As soon as my back was turned she directed her coachman to drive to Stewart's, where she purchased the materials for a dress; then she went to a mantua-maker's where she stood for a long time to have it fitted; she returned home in time to dress for a dinner-party, and afterwards went to a ball, where she danced until a late hour. On the following day, after my office hours, I called at her house, and found that she had gone out early. I called frequently, and finally wrote to her requesting that she would appoint an hour for a visit from me, but I was obliged to await her pleasure, and was unable to see her until the fifth day, when she called at my office to have the "nasty thing" removed. I was thankful to be allowed to remove it, but I informed her that she would have to seek further treatment elsewhere. Fortunately she needed no further treatment as the granulations which had existed in the canal were destroyed by the long pressure, and owing to the continued drainage and stimulus afforded by the tent the uterus returned rapidly to its natural size.

Other agents have been employed for the purpose of dilating the uterine canal, but none answer so well as the compressed sponge, and are consequently of but little value for surgical purposes or as aids in diagnosis. The laminaria digitata, or sea-tangle, it was thought would supersede the sponge, and would lessen the risk from blood-poisoning; but apart from its limited dilating capacity there are other objections to its use. It has been found to expand unequally throughout its length, and when this happens, in the end occupying the upper portion of the uterine canal, it becomes exceedingly difficult to remove it. The laminaria is frequently more irritating than the sponge, from being stiff and unyielding, and as it expands much slower it is also more difficult to keep it from slipping out of the canal. When the os is contracted to such a degree that a sponge tent cannot be made to enter, a short section of laminaria is found useful to open the canal of the cervix sufficiently for the subsequent introduction of the tent.

Dr. G. E. Sussdorff, of New York, has recommended,[1] as a substitute for the sponge tent, the root of the tupelo tree, the nyssa aquatica, which is found in the swamps of the Southern States. This agent is far superior to the laminaria, but has not the dilating power of the sponge tent. It is, however, a very valuable acquisition. The dilating capacity of this agent has been recently increased by greater compression in the preparation of the tents. A canal is now left throughout the length of the tent, which is gained without loss of substance, and this is claimed to be a great advantage in permitting a free escape of fluids from above. These tents are now also curved in their preparation, so that when needed the introduction can be made into a flexed uterus without the danger which would attend the use of a straight tent.

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[1] The Medical Record, New York, July 14, 1877.

Dr. Goldsmith, of Atlanta, Georgia, has employed tents of the compressed pith of the cornstalk for the purpose of dilatation. Unfortunately, this substance does not possess the dilating power of sponge, but nevertheless I have found it very useful for treating certain conditions of the uterus, which will be again referred to.

CHAPTER III.

SURGICAL INSTRUMENTS AND APPLIANCES.

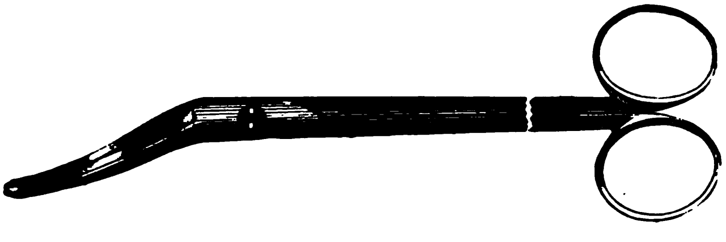
Scissors of various curves—Ball-and-socket knife—Needles—Sims's needle-holder—Emmet's needle forceps—Sims's feeder—Twisting forceps—Sims's shield—Double tenaculum—Sims's blunt hook—Hanks's counter-pressure hook—Silver wire—Mode of freshening surfaces, before the introduction of sutures—Silver sutures, and mode of introduction.

Mode of administering vaginal injections of hot water—Foster's vaginal syringe—Vaginal tampon; its use and mode of application.

Scissors.—For many years I have used scissors almost exclusively in preference to the knife, and have been instrumental in introducing them for the various operations about the female organs of generation. A surface can be thoroughly freshened with the scissors in less time, and with less bleeding than can be accomplished with the knife. When the latter has been employed it is not unusual to see an operation much delayed and even abandoned on account of the hemorrhage it caused.

I use four pairs of scissors, two of which have each a large curve to the blades, right and left, and two a smaller curve, also right and left. Those represented in Fig. 16 are of a lesser curve and are in general use. The other pair (Fig. 17) is invaluable, when properly made, for denuding a surface high up, or one running across the vagina. It is almost impossible to represent, by a drawing, the foreshortening of the curve of these scissors. The dip of the blades from

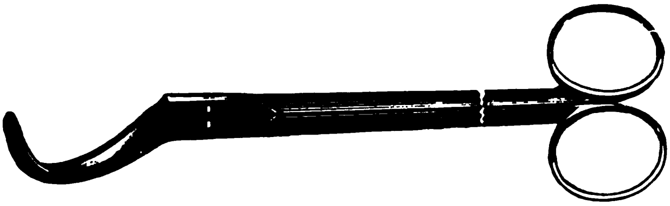
Fig. 16.



Emmet's slightly curved scissors.

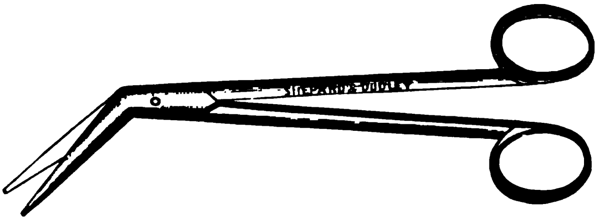
the handles is about thirty degrees, and their curve a quarter of a circle, with the extremity, or cutting end, somewhat prolonged at a tangent. The blades at the joint are vertical, but they gradually twist upon themselves until at their extremities they have a direction at a right angle to the handles. Some idea of this double curve may be obtained by placing the forearm on a table, with the hand rotated outward so that the backs of the fingers will also rest upon the table when semiflexed. A large number of these scissors sold by the instrument-makers are worthless, having no resemblance to the proper shape. Necessarily, each blade represents an arc of a different circle, and yet they must be so accurately adjusted that their cutting edges will not come in contact except near the points. Even where the shape has been preserved, the instrument frequently is found to be of little value, for, owing to bad workmanship, the blades cross each other and come in contact from the heel to the point. The result is, that the joint becomes strained and the blades being so close together as to leave no room between them for the tissues to pass, they can remove only a single bite at a time and not a continuous strip as they should.

Fig. 17.



Emmet's strongly curved scissors.

Fig. 18.

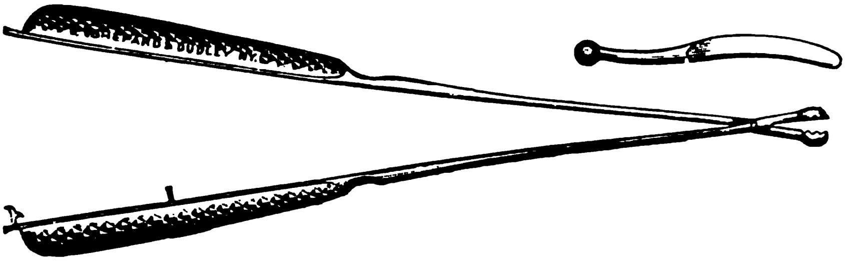


Emmet's scissors.

Another useful pair of scissors is shown in Fig. 18. They are used chiefly for dividing cicatricial bands in the vagina, for paring flaps, and for dividing the cervix backwards. These scissors are blunt pointed, bent at an angle, and not curved on the flat.

Occasionally, a knife is necessary at some point inaccessible to the scissors, and the BALL-AND-SOCKET KNIFE (Fig. 19) will be found useful. About the year 1861, Dr. Sims introduced a knife, for dividing the cervix laterally, which had a single joint, so that the blade could only be moved as the radius of a single circle and was locked by a screw in the joint. About two years afterwards, I devised the above instrument, of which the handles are represented in the figure at half size, and the blade without reduction. The shape and size of the blade are like that in Dr. Sims's instrument, but the ball-and-socket joint permits the blade to be placed at any angle, and firmly secured by locking the handles.

Fig. 19.

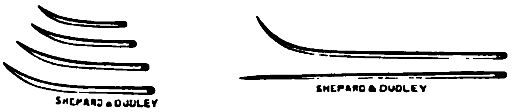


Emmet's ball-and-socket-knife.

Needles.—The round needles have the advantage of making only a punctured wound, which will be filled up by the suture. I was the first to advocate their use for all operations about the vagina. The needles in general use, which are spear-pointed or triangular in shape, with cutting edges and many times the diameter of the wire, frequently cause, in vascular tissue, a troublesome oozing after the sutures have been secured; and sometimes they leave small fistula along their tract if they pass too close to the bladder.

The needles I generally use are from one-half to three-quarters of an inch in length and round, with a slight curve near their point, and thickest at the eye, which is counter-sunk to receive the thread. The smallest sized needle is used for fistula in the bladder or rectum, and for other operations in the vagina. The next size answers best for closing lacerations in the cervix. The largest one is an ordinary sewing needle, thick and strong, and with a large eye deeply countersunk. This needle I use for closing a lacerated perineum, and the abdominal walls after ovariotomy. When the tissues are dense and cicatricial, as is frequently found about the cervix, it is often exceedingly difficult to introduce the round needle. But such tissue is not very vascular, and, consequently, does not call for use of the round needle. With this condition I frequently use the lance-pointed needle, which is very easy of introduction; but when the tissues are soft and vascular the round needle should be used.

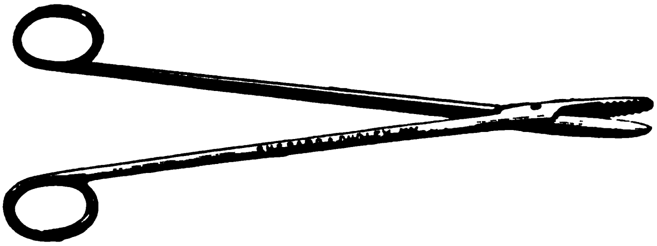
Fig. 20.



Emmet's needles.

The NEEDLE FORCEPS, Fig. 21, first introduced by Dr. Sims, is excellent in its firm grasp and the ease with which it thrusts the needle through the tissues at any angle. But I have had an instrument made with shorter jaws (Fig. 22), which affords still greater facility for introducing the needle. The handles are rough and flattened, so that they can be firmly grasped in the palm of the hand, and a spring is placed between them, so that the needle can be freed as soon as the pressure of the hand is relaxed. One jaw should be deeply serrated and the other faced with a plate of copper, by which means the eye of the needle is less likely to be crushed than it would be between two rough steel surfaces.

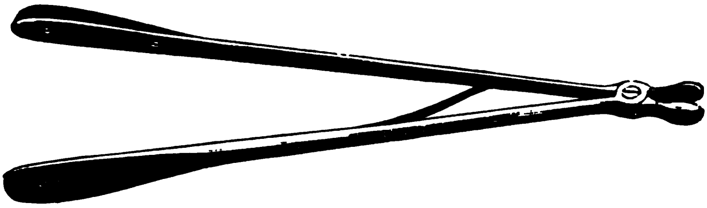
Fig. 21.



Sims's needle-forceps.

The "FEEDER" (Fig. 23) is a shallow forked instrument, devised by Dr. Sims, and is very useful to aid the passage of the suture when introduced in such a direction that it would cut into the tissues if traction had to be made at a sharp angle to its course.

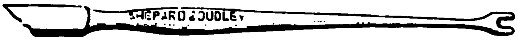
Fig. 22.



Emmet's needle forceps.

A pair of good dressing forceps will answer for securing the wire to the silk loop by which the metallic suture is to be introduced, but

Fig. 23.

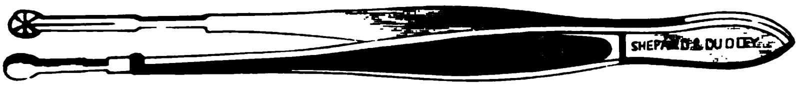


Sims's "feeder."

I use an instrument resembling the needle-forceps (Fig. 22), though of smaller size. A short angle of the wire is to be hooked into the loop, flattened by the forceps, and twisted once or twice on itself.

I have modified the TWISTING FORCEPS from the shape first used

Fig. 24.

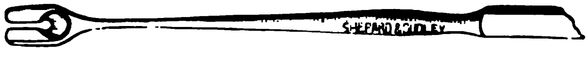


Emmet's twisting forceps.

by Dr. Sims, by making the jaws quite straight, and changing the mechanism by which they are closed.

Sims's SHIELD (Fig. 25) is used for steadying the sutures, and as the guide to the proper point at which the wires should be twisted. This

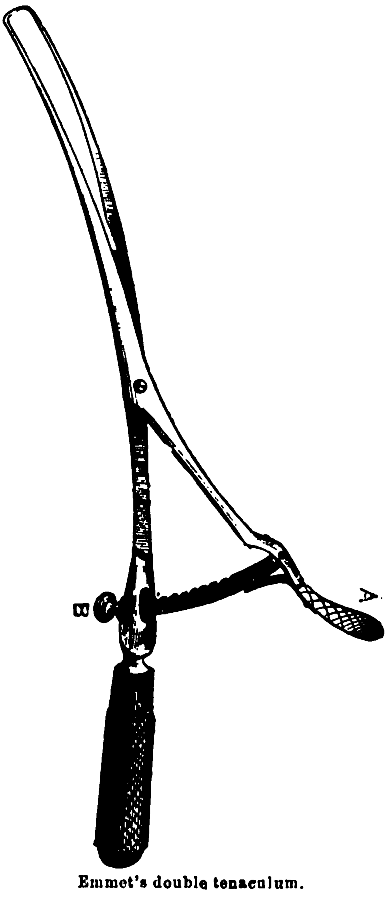
Fig. 25.



Sims's shield.

instrument was formerly made of steel, but I found it more useful to have it constructed of copper in one piece, and silver-plated. When made of copper it can be bent at any angle, so as to rest flat on the surface through which the sutures have been passed. The instrument sold is seldom properly made, for the edge, at the bottom of the slit, over which the wire is to be twisted, is so thick that it prevents the sutures being twisted up to the proper point.

Fig. 26.

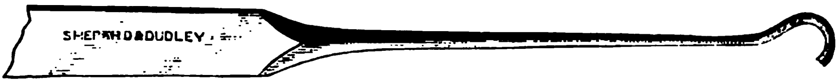


Emmet's double tenaculum.

The DOUBLE TENACULUM (Fig. 26) is used for operations about the cervix, for steadying the uterus when making applications, or when operating within the uterine canal. It is to be held in the left hand, and on depressing the thumbpiece at A the tenacula are made to separate, and put the parts on the stretch. They are brought together again by drawing back, with the index finger, the ratchet bar at B.

The COUNTER-PRESSURE HOOK (Fig. 27), which I had made, may answer the same purpose, but its chief value is for making counter-pressure as the point of the needle is passing through the tissues. A pointed tenaculum is generally used for this purpose, but it is too slight and is easily broken or bent out of shape. It should be made in one piece of hardened steel, and too large to bend or break.

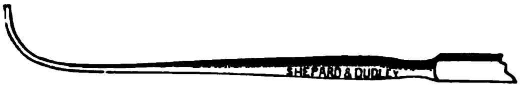
Fig. 27.



Emmet's counter-pressure hook.

Dr. H. T. Hanks, Assistant Surgeon to the Woman's Hospital, has devised a counter-pressure hook, in which the curve is nearly closed, for increasing the surface with which the pressure is to be made; and to prevent slipping a small spur is placed on the under side, which becomes buried in the tissues when the instrument is applied. It answers an excellent purpose.

Fig. 28.



Sims's blunt hook.

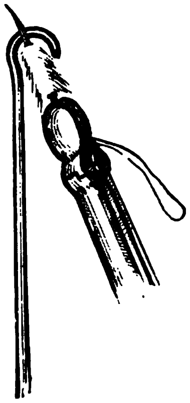
The BLUNT HOOK (Fig. 28) was used by Dr. Sims for the purpose of detecting small openings, and is, in fact, a steel probe.

Mode of Freshening Surfaces before the Introduction of Sutures.—When two surfaces are to be held together by sutures, they should always be denuded to an equal extent, so that no portion of the line of union shall be left to heal by granulation. If the parts are free from cicatricial tissue, and are freshened to a broad, smooth, uniform surface, and if the edges are accurately approximated, without tension, and the sutures do not cause strangulation, from being twisted too tight, we will usually obtain union by the first intention. It should be our object to secure as near an approximation as possible to this form of healing in all operations about the vagina, since any surface left to heal by granulation becomes more or less cicatricial, and will contract afterwards. In denuding a surface, it is better always to begin at the lowest point and pass upwards, for in this way we avoid the flowing of blood over the surface as the trimming progresses. At the starting-point, the tissue to be removed is caught up by a small tenaculum, and cut away, by either the scissors or the knife, in as continuous a strip as possible. I frequently remove the whole surface in a long, single, and concentric strip, by which I am assured that no portion shall be left undenuded.

The Silver Suture, and Mode of Introduction.—Various materials have been used for sutures in the different operations about the female organs of generation. Silver wire made from pure annealed silver is far superior to any other metallic suture; but that which is generally sold is made from coin silver, and is not as serviceable as the best quality of iron wire. If the surfaces are properly brought together, good results will often be obtained irrespective of the material used; but the silver suture has come into more general use than any other. If properly introduced no valid objection can be advanced against it, and experience has demonstrated its superiority over all others. Silver sutures have been long employed, but to Dr. Sims is due the sole credit of establishing their value. Since June 24, 1856, Dr. Sims[1] has used the interrupted suture in all operations, having found that it simplified the performance and fulfilled every indication. When I was his assistant in the Women's Hospital I witnessed the results demonstrated by him, and since that time my experience has fully confirmed his views.

The wire may be attached directly to the eye of the needle, and thus introduced; but it is liable to kink. The best plan is to pass first a silk or thread loop, and use it for drawing the wire through. The eye of the needle must be sufficiently large to admit both ends of the thread to form the loop, and this should be about six inches long. The needle must be large enough to admit of its ready passage with a half knot, which is to be made close to the eye to prevent the thread from slipping out.

Fig. 29.



Applying counter-pressure.

The point at which the needle is to be introduced is caught up with a tenaculum, and the needle is inserted just behind it. The needle is then advanced by the forceps into the tissues, and as soon as the point appears its progress is aided by making counter-pressure with the blunt hook around its point, as shown in Fig. 29. When it has passed as far as the head of the forceps will admit of, the exposed portion of the needle is to be seized and drawn entirely out, counter-pressure being continued with the blunt hook.

As each loop is introduced, it is better to follow at once with the wire, for the silk soon becomes weakened after being saturated with blood or urine. The wire is to be attached to the thread loop, as already described, and flattened with the wire-forceps, so as to offer no resistance in its passage. When a number of sutures are required, it will save time and some confusion afterwards to shorten each suture by drawing it well through, after which a small loop is made in the short end, and the long one passed through it to be held behind the speculum by the assistant until it is to be twisted.

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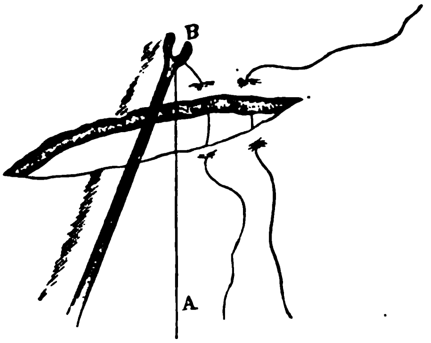
[1] See Silver Sutures in Surgery (p. 21), by J. Marion Sims, M.D., New York, 1858.

The use of the "feeder" has already been referred to, and Fig. 30 shows its application. The suture A is held in one hand, and, by means of the instrument in the other, it is made to pass through the tissues in the direction B. Without the use of this instrument, the suture would often cut through if the traction were made at a sharp angle to the line of introduction. Each suture should be made to include a liberal amount of tissue, and, as a rule, from four to five should be introduced to the inch.

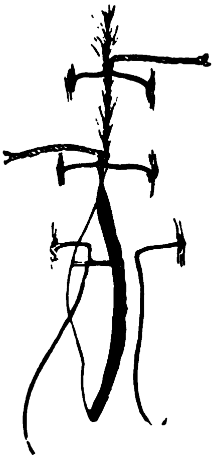
Fig. 30.



Using the feeder, in introducing sutures.

It was formerly thought necessary for the sutures to be introduced with the greatest care, so that the points of entrance and exit should be equally distant from the edges of the two surfaces to be united. The principle is correct, for it is important to avoid the approximation of a freshened surface with an opposite portion which has not been denuded, since no union would take place, and the line would be weakened. But, in reality, to introduce the sutures with any such accuracy is almost impossible, even after constant practice, and with the parts most favorably situated. Within a reasonable limit, this great accuracy is unnecessary if the sutures are properly "shouldered" at the time of securing them, so that the point of twisting shall be immediately over the line of union; in other words, each end of the suture must be bent on itself flat to the vaginal surface at the point of exit, and again at a right angle just over the edge of the surface to be united. Fig. 31 represents surfaces brought together by two sutures, which have been bent in the manner described, and secured by being twisted up to the angle over the line to be united, while the lower suture has been "shouldered" in like manner, but has not yet been twisted. If the suture be carefully bent at a right angle over the line, and only twisted up to this point, it is evident

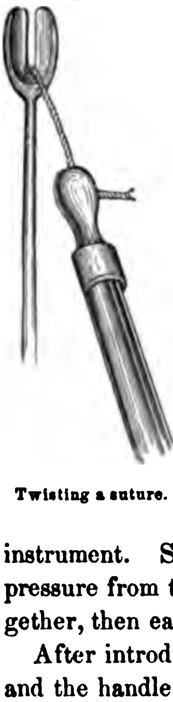
Fig. 31.



Shouldering sutures.

that there can be no turning in of either border. On introducing the sutures, it is better to begin with the most remote, and end with the nearest, each one being in turn placed to the upper side of the speculum where it can be held out of the way, and from being tangled. In twisting them it is generally most convenient to secure first the one nearest to the vaginal outlet, which will also have been the last one introduced. In other words, having looped together the ends of the wires as introduced, and placed them under the hand of the assistant holding the speculum, we twist the sutures in inverse order to that in which they were passed. By following up, with a tenaculum or blunt hook, the strand of each wire from the edge of the surface to be united, we can easily disengage it from the others. The long end of each wire is then held in the left hand, and the loop shortened by traction to about three-quarters of an inch in length. The little slip-knot is seized with the twisting-forceps so as to make sure that both ends of the suture are included within its grasp, and the excess of wire is cut off close to the instrument. Sufficient traction is made on the silver loop by counter-pressure from the flat side of the tenaculum, to bring the edges together, then each strand is shouldered properly, as already described.

Fig. 32.



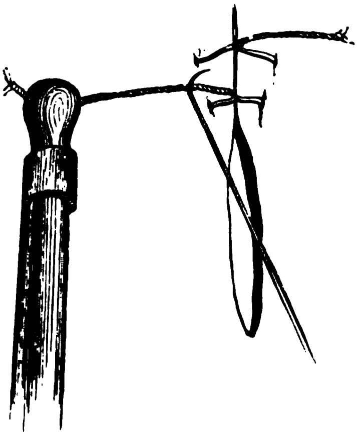
Twisting a suture.

After introducing the loop within the slit of the shield, the forceps and the handle of the former are brought close together, as shown in Fig. 32, and twisted until the angle formed by the crossing of two strands of wire is lost, just at the edge of the slit in the shield. If this edge over which the suture is to be bent by moderate traction, as the instruments are brought together, has been made as thin as possible, and if the twisting is not carried beyond a given point, it is evident that with ordinary care the denuded surfaces only will be brought into apposition.

If the parts are in a healthy condition, and have been properly freed from tension before the operation, the sutures will not cut out unless they have been drawn too tight, or twisted beyond the proper point. They should be made to lie flat on the vaginal surface after they have been secured. This is accomplished by bending them down over a tenaculum held close to the line of union, and then again using the tenaculum as a fulcrum to bend the twists in the opposite direction at the point where they are to be cut off (see Fig. 33). The angle formed by thus bending the suture, and where it is to be cut off, should be made about half an inch from the line of union. When there is room to admit of its being done it is well to turn the sutures alternately to opposite sides, to indicate where they are when ready for removal, as some of them occasionally become imbedded in the tissues.

The proper time for removing the sutures is between the seventh and tenth days, but this will be more specifically stated when treating of the special operations. They are removed by gently elevating each one in turn with the forceps, and clipping the nearest side of the loop, so that, as they are withdrawn they will continue to bind the parts until cleared.

Fig. 33.



Flattening the sutures to the vaginal surface.

Hot-water Vaginal Injections.—It will be shown hereafter that hot-water vaginal injections, of different degrees of temperature, according to the circumstances of the case, will prove an invaluable aid in the treatment of all uterine diseases. It is, therefore, of the greatest importance that they should be administered properly. When given in the upright, or sitting position, the effect is very little more than to wash out the vagina. *The full benefit* CAN BE OBTAINED BY ADMINISTERING THEM ONLY WHILE THE PATIENT IS LYING ON HER BACK, AND SHE CANNOT EFFICIENTLY GIVE THEM TO HERSELF. IT IS ALSO NECESSARY THAT HER HIPS SHOULD BE ELEVATED, and the quantity of water used should not be less than half a gallon for each injection.

A bed-pan of proper shape and size is indispensable to protect the clothing of the patient. The one known in the crockery shops as the English bed-pan, but now somewhat out of use, answers the purpose very well. For temporary use, the India-rubber inflated-cushion bed-pan will answer, but it is liable to stick together from the effects of the hot water.

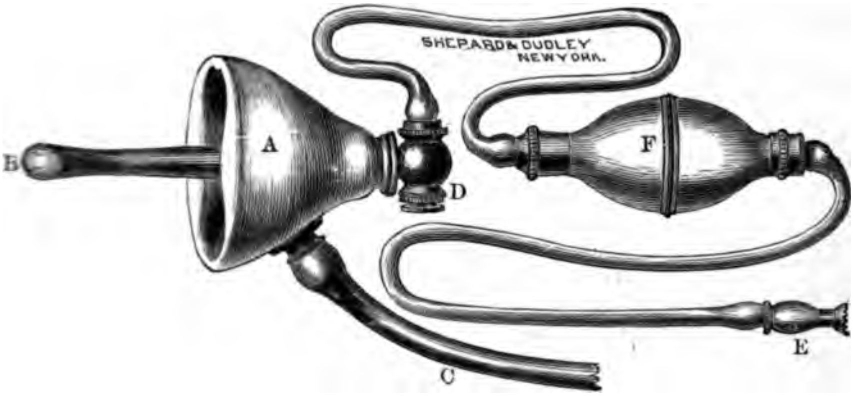
The shovel-shaped French bed-pan, more in general use in the sick room, does not answer for this purpose, as it allows the clothing of the patient to become wet. When using the regular bed-pan, it is necessary to place the patient so far forward on it that her weight will not tilt it up. Or the handle, which is hollow, may be turned to one side, and a piece of large India-rubber tubing stretched over it to allow the water to pass off into a receptacle placed alongside of the bed. For use in my private hospital I have this form of bed-pan made of copper, and, instead of so large a handle, there is a small spout which can be kept closed when not needed, by a cap over it. When a large injection is given, the cap can be removed, and a small piece of tubing, placed over the spout, will carry off the water.

The injection can be better administered to the patient after she is undressed for the night and in bed. She should be placed near the edge of the bed with her hips elevated as much as possible by the bed pan, and a small pillow under her back, the lower limbs being flexed. Her body must be covered, to protect her from cold, and her position made perfectly comfortable; when the bed is a soft one, a broad board should be placed under the pan to prevent it from sinking down by the weight of the patient, and to keep the hips elevated. The vessel of hot water is placed on a chair by the bedside, and the nurse passes the nozzle of the syringe over the perineum into the vagina, directing it along the recto-vaginal wall until it has reached the posterior cul-de-sac. The water must be thrown in, at first, very carefully, until the vagina has become distended. If the nozzle is not properly introduced, the stream of water may be thrown directly into the uterine canal. The forcible entrance of any fluid into the undilated uterus causes intense pain, and frequently alarming symptoms of nervous prostration or collapse; and sometimes it is the cause of an attack of cellulitis. At the completion of the injection, the vagina can be emptied by depressing the perineum for a few seconds, with the finger on the nozzle of the syringe before withdrawing it, and, as the bed-pan is removed, a napkin should be placed against the vaginal outlet to absorb any water which may have been retained.

When circumstances prevent the injections being thus administered, it is better to use a fountain, siphon, or syringe than that the patient should attempt to give them to herself. This mode, however, can only be regarded as a substitute, for it is never as efficacious. In any event the same elevated position of the hips is necessary. A steady stream is never as serviceable as the interrupted current from a Davidson's syinge. Hence it would seem as if, in addition to the heat of the water, the jet from the syringe acts as a stimulus to excite the bloodvessels to contraction.

Dr. Frank P. Foster, of this city, has had constructed an arrangement by which the bed-pan can be dispensed with, but which requires an assistant to administer the injection. A cup or shield, A, Fig. 34, is made by depressing one half of an India-rubber bag into the other half, and screwing the two together as at D. This point is pierced by the pipe of a Davidson's syringe, and fixed by a brass cap. On compressing the bulb F, the water is forced directly through the vaginal portion, or nozzle, of the syringe, which is pierced with a number of small holes. Now, as the soft India-rubber cup A is held over the labia, the only escape for the water is by the tube C. The nozzle B is attached by a short piece of tubing to the brass cap D, so that it may be returned in various directions without displacing the cup. The patient's hips should be elevated so that the vagina may be kept fully distended, and only the surplus water be allowed to flow off by the tube C. This arrangement is far superior to the fountain syringe, and, if it keeps the patient dry under all circumstances, it will prove a most valuable contribution. The doctor has demonstrated for me the working of the instrument on several cases, none of which were selected, and there was no leakage of any consequence in any, but I think the shield is occasionally liable to be displaced, as the nurse has to hold it firmly against the labia while, at the same time, she is giving the injection. This difficulty, however, may perhaps be overcome by attaching two straps to the cap D, one to be passed under the patient's back, where it will be secured by her weight, and the other over the pubes, to be held by her hand.

Fig. 34.



Foster's vaginal syringe.

Vaginal Tampon.—The purpose of a vaginal tampon is to control uterine hemorrhage, and, at the same time, to make uniform pressure on the vaginal walls, by which much of the blood supplied to the uterus is cut off. Few practitioners properly understand how to apply a tampon. The plan of passing in with the finger a few pieces of oiled rag, a little loose cotton, or one portion after another of a roller bandage, is worse than useless. It is impossible to tampon the vagina effectually without the aid of Sims's speculum. The mere stoppage of the escape of blood from the vaginal outlet is not sufficient, for the accumulation may continue unsuspected in the upper part of the vagina. When the uterine hemorrhage is free, we must prevent its escape from the os, as far as possible, and for this it may even be necessary to tampon the lower portion of the uterine canal. There is no danger of the uterus enlarging from concealed hemorrhage, as after labor, nor do I think there is any probability of the escape of blood through the Fallopian tubes into the peritoneal cavity. The formation of a clot within the canal will excite the uterus to contraction, by which it will be forced out into the vagina. This is just the condition we wish to bring about; for as the uterus contracts, its vessels are compressed, and the flow of blood checked.

The best material for tamponing the vagina is damp cotton. A quantity of it is to be soaked in water, and squeezed nearly dry. Then it should be thoroughly moistened in a saturated solution of alum, and again squeezed out. But before the cotton has become too dry, it must be separated into portions, of which the edges are to be turned over, so as when compressed between the hands, each shall be about two inches square, and half an inch thick. If the pieces are then placed one upon another, they will not become too dry before they can be used.

Before introducing the tampon, the bladder must be emptied, and the patient placed in the proper position on her left side, and the speculum introduced. All the blood and clots must be first removed from the vagina, and the whole passage mopped out with a piece of damp sponge held by a pair of long dressing forceps, or in a sponge holder. When the bleeding is profuse, it may be necessary to make an application of iodine to the uterine cavity, to excite contraction. After a pledget of cotton has been properly twisted on the applicator, and the instrument has been bent to the curve of the uterine canal, it is to be dipped into the iodine and passed to the fundus. I frequently leave the cotton in the canal, to get a fuller effect from the iodine, and it can be done with safety if a portion of it is left projecting from the os. If we wish to leave the cotton behind, it is only necessary to loosen it from the applicator, by giving the instrument several turns in the opposite direction to that in which it was put on; it is then only necessary to apply the nail of the index finger against one side of the instrument, as it is withdrawn, to cause the cotton to slip off and remain in the canal.

The packing of the vagina is begun by placing over the cervix a pledget of cotton, dampened afresh with the solution of alum. Then a mass is rolled up and placed in the posterior cul-de-sac, close to the cervix, a similar one on each side and in front, and a flat piece over all. The pledgets are next placed around the cervix in a circle, and the central space filled in. When the mass reaches the vaginal walls, it should be pressed back, with a stout whalebone stick, from the sides towards the centre, and, as room is thus gained, new portions of cotton must be slipped into place with a pair of dressing forceps, and press backward as before, the pledgets being packed, wherever space is gained. When the vagina has been well filled, the tampon is to be pressed firmly back with the stick from the anterior wall of the vagina towards the hollow of the sacrum, and when the speculum has been placed in front of this, the space left will extend nearly up to the uterus. This is to be filled in in the same manner until the whole canal shall have been firmly packed. No force should be used, but, by going around and around the mass, and firmly packing in, with the forceps, one small portion after another, we can gradually distend the vagina, if necessary, until the whole basin of the pelvis is filled by the tampon.

It is always necessary to confine the patient to bed, and to give an anodyne if the tampon is a large one; and the bladder may have to be emptied by means of a flexible male catheter. It is best, as a rule, to administer the anodyne by enema, using for this purpose, as I commonly do, the acetated tincture of opium. Or, if more convenient, a suppository of morphine and belladonna may be used, but it must be passed high up into the rectum before the tampon is introduced. The most distressing effect of a large tampon is due to its pressure on the neck of the bladder. Should the anodyne fail to relieve this, the position of the patient must be shifted across the bed, her hips brought near the edge, her limbs flexed, and some of the cotton lying near the neck of the bladder be carefully removed. This may be done by means of forceps, or better, by twisting the notched whale-bone swab-stick into each piece, using the index finger as a guide. In a few hours, the vessels will have had time to contract, under the influence of the pressure, so that, as a rule, a sufficient quantity of the cotton, to give relief, may then be removed with safety if the patient continues to keep the horizontal position. Notwithstanding the astringent and disinfectant properties of the alum, it will be necessary after twenty-four or thirty-six hours, to remove the tampon, since by that time it will have become offensive from being saturated with blood and the secretions. After its removal a large injection of hot water containing a little impure carbolic acid should be administered, to wash out the vagina thoroughly, after which the tampon may be replaced if necessary. As the flow will, in all probability, have been greatly lessened by the pressure of the first tampon, the second one will not need to be so large. Before replacing the tampon it is well to encircle the cervix with several pledgets of cotton saturated with glycerine. This is not only a good disinfectant, but it also renders the condition of the patient more comfortable by removing the heat and dryness of the vagina which habitually follow the use of the alum and tampon.

CHAPTER IV.

FORM FOR A RECORD OF CASES; MODE OF EXAMINATION; CHIEF POINTS FOR DIAGNOSIS.

Blank form for records—Neatness in person and instrument—Examination table—Digital examination: its value; mode of making it; points to be noted—Conjoined examination—Physical signs of a retroverted uterus; of a flexed uterus; of a uterine fibroid—Enlarged uterus: differentiated from pregnancy, and from other bodies, growths, tumors, hemorrhagic collections, etc.—Condition of vagina, urethra, bladder, cervix uteri, perineum, rectum—Dilating the urethra, a reprehensible practice.

Mode of using the speculum—Points to be noted—Use of probe—Latent cellulitis.

A HISTORY should be kept of every case, for future reference. While the fullest details on all points of practical value are desirable, they should be recorded in a condensed form. A few inquiries judiciously put, will elicit information enough to enable us to ask often essential points only, and thus much time and labor may be saved.

At the first consultation it is well to let the patient make her own statement without prompting her, as she will, doubtless, have settled beforehand in her own mind the all-important features of her trouble. Very likely her statement may have but little bearing upon the case, but the physician must listen patiently long enough to make her feel that it is being thoroughly investigated, for this will inspire confidence and assure her of his interest. If she is nervous she should be encouraged to control herself, so that she may answer intelligently any questions that may be necessary. But, after having fully heard the patient, and having begun to record the history of the case, I make it a rule that she shall only answer my questions.

The following is the outline I generally use for recording cases; by filling it in with the special points of each, a full history can be secured. It will be necessary to leave ample space in the case book for "First symptoms of disease," "Present condition," for what "Physical examination" discloses, and for the "After history and treatment." I give here the history of an imaginary case, one frequently met with in practice. The printed part of the form is in small capitals, some of the words being erased, as if with a pen; and the italics show the filling in.

DATE OF FIRST CONSULTATION. *Jan. 1st*, 1876. RECOMMENDED BY
RESIDENCE. *New York.* *Dr. John Smith,*
OR HUSBAND'S PLACE OF BUSINESS. *Wall St.* *New York.*

NAME, *A. B.* AGE, *30.* ~~SINGLE~~ MARRIED. AGE OF FIRST MENSTRUATION, *fourteen.* REGULAR *after two months.* *Slight* ~~NO~~ PAIN, IN THE BEGINNING OF, ~~DURING~~, ~~AFTER~~, THE FLOW. LASTING *four days.* GENERAL HEALTH *always good.* MARRIED *ten* YEARS. NUMBER OF CHILDREN, *one.* NUMBER OF MISCARRIAGES, *one.* AT *three* MONTHS. LAST PREGNANCY, *miscarriage, eight* YEARS SINCE. CHARACTER OF LAST LABOR, ~~NATURAL~~, ~~TEDIOUS~~, RAPID, ~~INSTRUMENTAL~~. IN LABOR *5* HOURS. *Had* DIFFICULTY AFTERWARDS *on standing from bearing down, with frequent desire to empty the bladder. Did not recover her strength. Unable to nurse her child. Received some local treatment, and improved previous to the miscarriage.* HAS NOT BEEN WELL SINCE *birth of child, worse since miscarriage.* BEGAN TO SUFFER AFTERWARDS FROM *constant backache, leucorrhœa, frequent show, pain down the limbs, irritability of the bladder increased, unable to stand or walk; constipation of the bowels.*

PRESENT CONDITION. *Has become exceedingly nervous; neuralgia of the face; leucorrhœa throughout the month, but more profuse after the period; menstruation somewhat irregular as to time, always a day or two too soon, lasting now six days, but the quantity is rather less than formerly; suffers now from painful menstruation, generally towards the end of the flow; has become more constipated, and suffers great pain after each movement of the bowels; irritability of the bladder has continued, and cannot walk or stand without increasing the pain in the back and down the limbs; can seldom sleep without an anodyne; frequent headaches; feels sometimes as if she would become insane; suffers from strange sounds and trouble in the head, as if from the dripping of water; has frequent attacks of palpitation of the heart; loss of appetite, etc.; dyspepsia; suffers from cold feet.*

PHYSICAL EXAMINATION DISCLOSES *laceration of the perineum, down to the sphincter; prolapse of the posterior wall of the vagina; uterus retroverted and enlarged; cervix lacerated on both sides to the vaginal junction, and flaps rolled out, covered with an extensive erosion; profuse cervical leucorrhœa; depth of the uterus three inches and a half.*

TREATMENT AND RESULT……………………………………………………………

If we analyze the history of the above case, it will be seen that the patient was in good health until her labor. The first symptoms of disease, as stated, are so characteristic that there would be little doubt as to what would be found, even before a digital examination had been made. Her labor was unusually rapid, and attended with laceration of the perineum and neck of the uterus. As soon as she began to stand on her feet, prolapse of the posterior wall of the vagina commenced. The laceration of the cervix would retard the return of the uterus to its natural size, after the birth of her child, and on account of its increased weight, it would descend near the floor of the pelvis. Gradually, as the rectocele increased, the neck of the uterus would settle still further forward towards the vaginal outlet, in the direction offering the least resistance. This would necessarily throw the fundus of the womb backwards, and it would become retroverted just in proportion as it advanced towards the mouth of the vagina. As the uterus was crowded downward the two flaps in the lacerated cervix would be forced apart more and more. This would act as a source of irritation which would rapidly increase the size of the uterus, cover the flaps with an erosion, and cause a profuse leucorrhœa, and backache. The increased weight of the uterus would increase the pressure on the nerves, and cause pain in the limbs; while at the same time, the pressure and dragging on the anterior wall of the vagina, would give rise to irritation of the bladder. It may be that she had received some local treatment, and had improved. It is likely, however, that the laceration in the cervix was not detected, and the displacement not corrected. The erosion chiefly caused by the secretions, which had been greatly increased in the effort of nature to relieve the congested condition of the uterus, was doubtless supposed to be ulceration, and held to be the chief difficulty. No doubt the nitrate of silver was applied until the surface of the supposed ulcer became cicatrized. A temporary improvement took place in her general health, and, before a relapse could occur, she became pregnant. In consequence of the displacement of the uterus backwards, and the limited space to which it was confined in the hollow of the sacrum, the organ could not increase in size after a certain time. The larger it became, the more marked was the retroversion and the general disturbance, until, at length, miscarriage took place. This increased the difficulty, by leaving the uterus larger than it was before, so that all her old symptoms returned with renewed force. From the increased retroversion, making continued pressure on the rectum, habitual constipation was induced, followed by a fissure or crack in the anus, which necessarily, added to the difficulty. Sterility and irregularities in menstruation then followed as a natural consequence. The leucorrhœa also kept up a continued drain, from which, and from the want of sunlight, she gradually became anæmic, a condition in which the blood is so wanting in its morphological elements as no longer to afford a healthy nutrition and stimulus to the nerve centres. This will account for her "trouble in the head," the irregular action of the heart, and for her nervousness, neuralgia, etc.

I have thus, in as brief a manner as possible, pointed out the practical bearing of the main features of this suppositious case. Hereafter we shall find other local causes producing the same general disturbance here noted, so that many of the symptoms will be found in every case passing under observation.

MODE OF EXAMINATION AND CHIEF POINTS FOR DIAGNOSIS.

A patient once informed me that she had refused to submit to an examination because she noticed that the physician whom she consulted did not keep his finger-nails clean. This circumstance convinced her that if he was so negligent of his own person, he would be quite as likely to neglect the details of her case. Although her deduction did not necessarily follow yet for her own protection it was well that she avoided the risk of an examination. A physician should always be scrupulously neat in his person, but it is particularly essential that he should, at least, keep his nails short and clean. When examining a number of cases, if negligent, he may cause a vaginitis, by transmitting secretions under his nails, from one patient to another. He should always wash his hands thoroughly before and after each examination, always using the nail brush after examining a patient suffering from a profuse vaginal discharge. Not only is the precaution necessary for the protection of the patient, but it also renders his own sense of touch more acute. It is equally necessary that every instrument used in an examination should be thoroughly washed, and, where the secretions have been of a suspicious character, a little carbolic acid, or some other disinfectant, must be added to the water. I have found an ointment of boracic acid, in proportion of one part to six, very serviceable for common use, and keep it on my stand to lubricate the speculum and my finger when making vaginal examinations.

A table, four feet long, thirty inches in height, without the castors, and twenty-four inches wide, has been adopted for all operations and examinations in my private hospital. For my office practice, I have an invalid chair, made of the proper height and width. The patient takes a seat, and, when told to lean back by the nurse, is placed in [illegible] horizontal position by the upper portion of the chair turning down. [illegible] table, as I have described, covered with several folds of a blanket, with a sheet and provided with a small pillow, answers as well as, if not better, than an expensive chair. The only objection to the table is its formidable appearance, which, to a new patient, is perhaps suggestive of a surgical operation.

When the sense of touch has been cultivated, it yields more information upon which to base a diagnosis than can be gained by the eye alone, even when used under equally favorable circumstances. Therefore the digital examination should always be thoroughly and systematically made. It is all-essential to possess a knowledge of departures from a healthy condition. The lighter the touch the more acute will it be and the more certainly will it appreciate slight changes. It is indeed remarkable how individuals vary in their method of making examinations. One will proceed with as much vigor as if he were boring a hole, and finds little more than the cervix, which feels like an obstruction in his way. He gains no information of importance, and inflicts unnecessary pain on the patient. Another, in less time, will pass his finger lightly over every portion of the vagina, and quickly ascertain enough to enable him to fully understand the case and without having caused any pain. The manner in which I have sometimes seen this examination made, even by men of experience, can be described only as brutal; the amount of suffering they needlessly inflict, and the want of tact evinced by them ought to debar them from the practice of any branch of the profession.

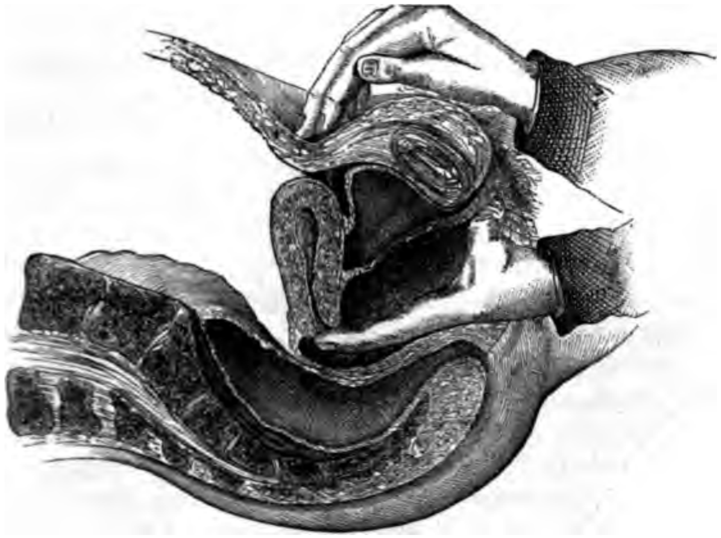
A digital examination can be most thoroughly made by placing the patient on the back, her limbs drawn up, and her hips near the edge of the table within easy reach of the operator. She must be covered by a sheet, her knees well separated, and her feet within six inches of each other. The index finger of the left hand should be used for vaginal examinations as its sense of touch is the more delicate, and the right hand should be left free for palpation through the abdominal wall. After the hands have been well washed, and the index finger greased, the left hand is to be passed under the sheet along the surface of the table until it reaches the sulcus between the buttocks. Then the index finger is slid along the perineum and over the fourchette into the vagina. When the finger has been passed a short distance within, the perineum should be gently but firmly depressed for the admission of air, which will open up the passage and give sufficient space for the examination. After this the hand is to be rotated, with its palm uppermost, so that the curve of the finger may conform to that of the vagina; the other fingers and thumb being closely flexed, so as not to touch the neighborhood of the clitoris.

As the finger is advanced in the passage, the perineum must be pressed backward, until the cervix has been reached.

We must first note the position of the neck in the vagina, its size, shape, density, whether there be an erosion, and the size of the os. The position and size of the cervix will give some indication of the condition of the uterine body. All of these points are to be studied in their relation to sterility: and the shape of the neck if flexed, and any narrowing of the os will be of special interest, as causes of painful menstruation. There will perhaps be symptoms elicited in the history of the case indicative of cancer, and if this be present, it will be recognized by the density of the infiltration, or some characteristic growth or ulceration. But the ordinary erosion found on the neck possesses little importance beyond being an indication that the pelvic circulation is obstructed. Unhealed surfaces may also be due to laceration of the cervix—an injury occurring during childbirth which maintains the enlargement of the uterus, and keeps up a profuse leucorrhœa. This condition is frequently overlooked, yet it is one of the most common causes of disease, and can often be detected by a digital examination alone.

By placing the right hand over the abdomen, just above the pubes, and, by conjoined manipulation with the finger of the other hand in the vagina, we are able to judge of the size and location of the uterus. As shown in Fig. 35, the right hand is making pressure on the abdomen so as to bring the uterus within reach of the two hands, from which a very accurate idea of its size can be formed. By this means we are able to feel the uterus in its normal position, or if displaced forward or to either side; if it is retroverted, of course, it cannot be thus included between the two hands, but must be felt for in the vagina or rectum. Conjoined manipulation enables us also to ascertain the extent of growths on the outer surface of the uterus, and the relation of the organ to tumors in the neighborhood. The first clue to the position of the uterus is obtained by the finger in the vagina as it is passed around the cervix, and the impression received will be confirmed by the hand on the abdomen, or it will become evident that other means will have to be resorted to for an accurate diagnosis. As the finger is drawn forward from the cervix, we will be able to feel through the anterior wall of the vagina and bladder whether the uterus lies anteriorly. Passing the finger to each side of the uterus enables us to detect a lateral version, should one exist, or any mass that may be there. If the uterus or any thickening is found on either side it is to be supposed, until proved to the contrary, that inflammation has previously existed between the folds of the broad ligament; and probably also a laceration of the cervix will be found on the corresponding side.

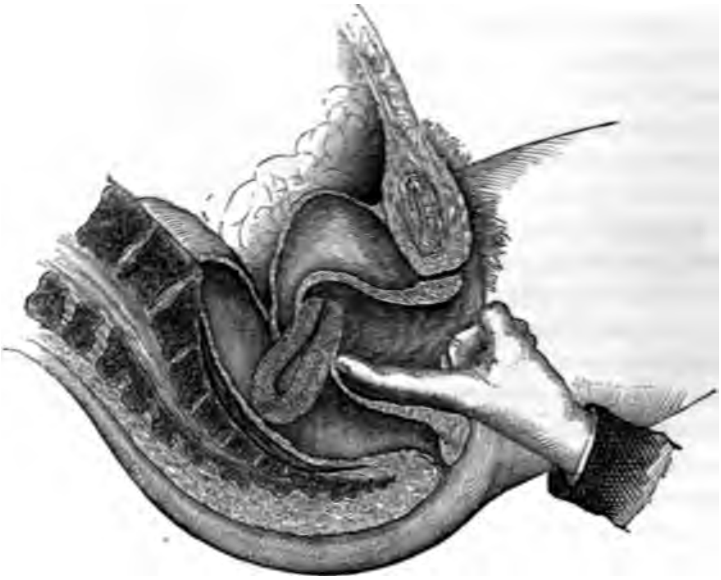
Fig. 35.



Vaginal touch and conjoint manipulation.

When the uterus is retroverted, its posterior surface is brought in front, and can be easily felt through the posterior cul-de-sac of the vagina, as shown in Fig. 36. We cannot, however, be sure that a mass felt in this position is the uterus retroverted, unless the retroversion is excessive. In this case the neck may be felt pointing in the opposite direction to that in which it points when in a normal position, as will be seen at a glance by comparing the two figures 35 and 36. The fundus of the uterus in Fig. 36 has rotated from the natural position through nearly a third of the circle; it may, of course, be retroverted to a less extent than represented and at any angle between these two points. The uterus may be partially displaced backwards by a growth on its posterior wall; or it may be thickened from a previous inflammation, and it will be necessary to use the probe in order to ascertain the true condition. The body of the uterus is frequently bent upon itself, forming a flexure which cannot always be distinguished, by the finger in the vagina, from an outgrowth on the surface of the organ. For instance, in Figs. 37 and 38, it is shown that the finger would easily detect the sulcus in front of the cervix, both in A and B, and the condition might be supposed to be one of anteflexion in both instances. In Fig. 38 flexure of the body forward does exist, but in A there is a fibroid growing out from the front of the uterus, without obstructing the canal, and the organ is nearly in a normal position. By conjoined manipulation we might be able to decide between the two, but there would, in all probability, remain a doubt until the direction of the uterine canal were determined by means of the probe. We can easily imagine that the same difficulty would present itself in the diagnosis between a retroflexion and a partial retroversion due to a fibroid growing from the posterior wall, and the question could be settled only by the same means. Bodies smaller than the uterus may sometimes be felt in the pelvis, accompanying a displaced uterus, and it is important to detect their connection and nature. Either an enlarged and prolapsed ovary, a cyst in the broad ligament, or a pedunculated fibroid may displace the uterus. An ovary enlarged sufficiently to prolapse will always fall into Douglas's cul-de-sac, and lie generally under the retroverted uterus; it is very painful on pressure, and being confined to one side of the median line, it can be moved only in the direction from which it is prolapsed.

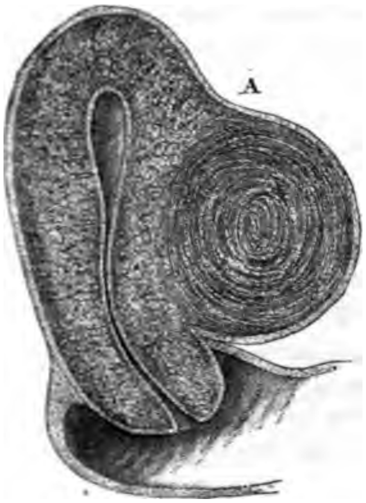
Fig. 36.



Retroverted uterus.

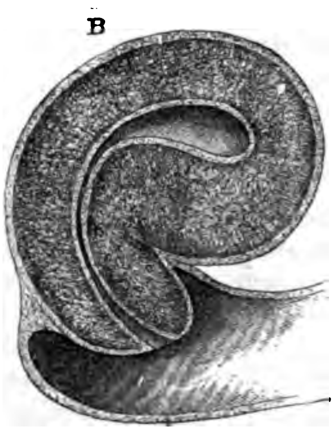
Cysts are chiefly found in the ovary and broad ligament; they are not painful on pressure, and do not prolapse into the cul-de-sac, as does an enlarged ovary. By passing a finger into the rectum we are generally able to detect their true character. A pedunculated fibroid is very dense, and is not sensitive to the touch. When the pedicle is long enough to admit of the usual freedom of motion, the tumor will seldom be twice found in the same position, and will, generally, displace the uterus backward or forward.

Fig. 37.



Fibrous tumor in the anterior wall of the uterus.

Fig. 38.



Anteflexure of the uterus.

It is of great importance to form an accurate opinion, at an early stage of the digital examination, as to the mobility of the uterus, not only as to its connection with a neighboring growth, but equally in the absence of any such body. If we are able to appreciate, by means of the finger, that the uterus is not as movable as it should be, we must proceed in the examination with great care, under the supposition that there has been inflammation of the connective, or cellular tissue about the uterus; and while it is necessary to ascertain its character and extent, the examination must not be conducted roughly, or it might result in bringing on an acute attack.

When the uterus is found to be enlarged, we must make an attempt to ascertain the cause of the enlargement, for, until this has been accurately determined, we cannot institute the proper treatment. The presence of a mass in the pelvis or abdomen may be readily appreciated by the bimanual examination, but it may require a further investigation before it can be determined whether it is formed by an enlarged uterus, an external growth involving the organ or its vicinity. In view of the various possible conditions, we are to examine for them systematically somewhat in the following order, not because this implies any relation to the frequency of occurrence of one or the other, but because it will enable us to exclude with certainty each successive condition, and so expedite our examination without detriment to the patient:—

1. Pregnancy.
2. Enlargement of the uterus, with cellulitis or hæmatocele.
3. Enlargement remaining after a miscarriage or childbirth. (Subinvolution.)
4. Enlargement of the uterus from growths in its walls and within its cavity.
5. Enlargement of the uterus (congestive hypertrophy) in the unmarried or sterile.
6. Ovarian tumors, extra-uterine pregnancy, and other growths in proximity to the uterus. The previous history of the case will generally be an important guide to the condition, but cannot be relied upon exclusively.

When we have ascertained from the patient that there has been no menstrual flow for several months, the natural inference is that pregnancy exists, but the length of time since the last flow should bear some relation to the size of the uterus at the time of examination. Pregnancy may be suspected, but we have no sure, and, at the same time, lawful means of proving its existence before quickening, or, until the enlarged uterus has risen from the pelvis into the abdominal cavity. When this has occurred, if pregnancy exist, the beating of the fœtal heart may be detected, or the motion of the child may be felt, and either of these must be accepted as conclusive evidence. The uterus will be then found softer and more uniform in shape than when enlarged from a fibrous tumor in its wall. The history of the case, should a fibrous tumor be present, would probably also indicate the existence of hemorrhages for a longer period than that during which pregnancy could have existed. It is, therefore, in the early months of pregnancy that the chief difficulty in making a diagnosis is experienced. All the early symptoms of pregnancy may also result from enlargement of the uterus from other causes, and a "show" may occur, with some regularity, for several months after pregnancy has taken place, coming from an erosion of the neck. We are, therefore, always to be on the lookout for such possibilities, and when in doubt, it is better to wait a few months until the true condition can be established without risk of injury to the patient. To bring about an abortion by our own carelessness in making an examination, is quite as culpable as if done with criminal intent. Pregnancy can hardly exist without furnishing some symptoms to lead us to suspect it, and it ought not to escape us if the investigation is properly made. I have frequently had women consult me, giving fictitious statements of their cases, and when I had concluded the examination, merely a digital one, they have expressed their surprise that I had not passed the sound. Afterwards they have candidly acknowledged that they knew of their pregnancy, and came to be examined, thinking, that as I was accustomed to the introduction of the sound, it would be done without injury to them, and would be the means of producing an abortion. We should, therefore, be continually on guard, not only for our own protection, but also in the interest of the patient, who may not be aware of her situation; for the occurrence of an abortion would, in all probability, seriously complicate her condition.

Inflammation, more or less in extent, of the cellular tissue about the uterus, is of very frequent occurrence, and it may so involve the organ as to render it difficult to judge of its exact condition. The history of the case will not always lead us to suspect the complication previous to making the examination. If a recent attack has occurred, the finger will detect a hard, unyielding, flat surface stretched across the roof of the pelvis, which will be painful on pressure, and cannot well be mistaken for any other condition. Although the uterus will always be somewhat enlarged, from the inflammation obstructing the circulation, we will find, by the aid of the hand over the abdomen, that the length of the uterus bears no proportion to the size of the mass as indicated by the finger in the vagina. To be able to detect and appreciate the stage, as well as the extent, of this always somewhat serious complication is very important; and, without proper care in conducting the examination, a fresh attack may be brought on.

Hemorrhage sometimes occurs in the pelvis, forming a hæmatocele which it may be difficult to differentiate from the cellulitis that frequently accompanies it. But the history of hæmatocele generally indicates that the attack was sudden, coming on, as a rule, about the time of the menstrual period, and accompanied by prostration and other symptoms indicative of loss of blood. If recent, the mass will be felt to be softer than that of uncomplicated cellulitis, and its shape will also be different. A depression can also be detected by the finger between the mass and the uterus, as if two rounded surfaces were lying in contact. The blood accumulates first in the posterior cul-de-sac, that being the lowest point to which it gravitates; and the collection acquires the rounded outline of that location; this never occurs with cellulitis. Again, when the collection is extensive, one hand placed over the abdomen, and a finger of the other in the vagina will detect the mass extending off to one side, in a flattened form, above the point for cellulitis; and it cannot be mistaken for the uterus. In this condition, we must also exercise great delicacy of touch, and leave the position of the uterus undisturbed for fear of reproducing the hemorrhage.

After a miscarriage, or a childbirth, the uterus may remain too large, from imperfect involution. The organ will generally be found movable, free from adhesions, and uniformly hypertrophied throughout. The neck will frequently be found lacerated and covered with an extensive erosion, with the uterine canal open, and emitting a profuse leucorrhœa. The history of the case will likely indicate that some difficulty followed a previous pregnancy, menstruation perhaps becoming either scanty or too free, and, as a rule, more painful. The local condition will be easily recognized, and the most important point will be to establish the cause of the sub-involution, with the view of instituting the proper treatment. We will find the chief causes of sub-involution to be laceration of the neck, cellulitis, displacement of the uterus from laceration of the perineum, and prolapse of the vaginal walls. The general health will also be impaired.

A fibrous tumor should never be mistaken for pregnancy, since the record of the case, with rare exceptions, will show the frequent and irregular occurrence of hemorrhage during a long period of time. If large enough to occupy any portion of the abdomen, its surface will be found hard and irregular, or nodulated. Occasionally, we may meet with a case of fibrous tumor where a long interval has occurred without even a menstrual show. Under these circumstances we must have all doubt, as to a possible coexisting pregnancy, removed before we make any attempt to reach the interior of the uterus. When a growth is within the uterus, or nearer to the inner surface than to the outer one, the organ may be uniform in shape, and we may be unable to arrive at any definite knowledge of the condition until the canal is dilated by a sponge tent sufficiently for the introduction of the finger.

The body of the uterus is frequently found enlarged, from some obstruction to the circulation, in females who have never been pregnant. A flexure above the vaginal junction often exists in these cases, and the remains of a previous attack of cellulitis may possibly be detected. The enlargement is found in women who have been in the habit of taking means to prevent conception, or with whom sexual intercourse has not been properly performed, owing to incapacity on the part of the male, and in those who persistently violate nature's laws.

Without a knowledge of the previous history of the case, an ovarian cyst or tumor may be mistaken for pregnancy, but its growth is generally of much longer duration than the term of pregnancy. It does not affect menstruation, as a rule; fluctuation can generally be detected at some point in the mass; and, from the vagina, the uterus can be felt to be of a normal size, lying either backward or forward under the tumor. It is sometimes difficult by means of palpation alone to make a diagnosis between an ovarian cyst and a fibro-cyst of the uterus, but, when the latter exists, the organ is generally found, on passing the probe, to be very much enlarged.

Extra-uterine pregnancy fortunately is of rare occurrence, and its existence is seldom suspected until rupture of the sac takes place. This lasts sometimes far beyond the usual term of gestation, and this may lead to an examination, which, however, may not reveal the exact condition; for, if death of the fœtus has taken place, the mass may have become partially or wholly encysted, but the uterus, although somewhat enlarged, will not be involved in the cyst, unless indirectly from the occurrence of cellulitis.

Abscesses in the cellular tissue of the pelvis, between the broad ligaments, and in the substance of the ovaries, are sometimes found. The history of each case will give evidence of constitutional disturbance from inflammation and the formation of pus, and it will not be difficult to establish the fact that the uterus itself is not involved.

Cancerous infiltration of the tissues of the pelvis and of the omentum need only be mentioned, as it is easy to ascertain its relation with the uterus and other organs.

After obtaining all the information to be gained by a digital examination, we should note the size of the vagina; any prolapse of either wall; thickening of the urethra; tenderness in the pelvis; and whether there has been laceration of the perineum, and, if so, the conditions resulting from it. There will be no need of an examination of the bladder unless some point in the history of the case should indicate its necessity.

But no examination is complete until the finger has been passed into the rectum to confirm the impressions obtained by touch from the vagina, and to ascertain the condition of the gut itself. At the entrance, within a fold of the sphincter, an unsuspected fissure may be found, which, by reflected irritation, may cause irritability of the bladder, and disturbance of the circulation in the pelvis, leading to dysmenorrhœa, tenesmus, prolapse of the uterus, leucorrhœa, and congestion of the ovaries. All of these conditions I have been able to trace directly to the presence of an anal fissure; and relief has followed its cure. A fissure is always accompanied with obstinate constipation, a condition which, if not relieved, will, in consequence of the obstruction to the circulation which it causes, greatly retard the recovery of any case of uterine disease. The presence of a rectal polypus will also evoke a great deal of reflex irritation in the neighboring organs. But the great advantage of a digital examination through the rectum, is the facility it gives us to explore portions of the pelvis which cannot be reached through the vagina. Through the rectum we can bring within range of the finger nearly the whole posterior wall of the uterus, if of normal size, and detect any enlargement of the ovary in that direction. The extent of a cellulitis can be thus fully mapped out, and we can judge of the nature of growths which may not even have been suspected from a vaginal examination.

The late Prof. Simon, of Heidelberg, has so far appreciated the advantage to be gained from a rectal examination, that he was in the habit of introducing the whole hand even beyond the sigmoid flexure. I have succeeded in passing my hand into the rectum several times, and without the slightest bad result, as the sphincter entirely regained its power in a few days; but I succeeded in gaining no more information than, nor even as much as, I could with one or two fingers alone, since the hand was cramped and had no freedom of motion. To introduce the hand it is always necessary to administer an anæsthetic. If this is done I can, with two fingers, reach well up to the sigmoid flexure, and by conjoined manipulation make a more thorough exploration of the pelvis than when no anæsthetic is used. As the sigmoid flexure is so bound down, I cannot divest myself of the conviction that it is dangerous to attempt to pass beyond it.

I shall refer briefly to the recently introduced practice of exploring the bladder and anterior wall of the uterus by means of the finger passed through the urethra. Prof. Simon used a graduated series of dilators of conical shape, and recommended that the urethra should be dilated rapidly. I have used the dilators, and have also employed [illegible] alone as a dilator; I have brought about the dilatation rapidly, and I have accomplished it gradually, but always with great care. In my book on Vesico-vaginal Fistula, published in 1869, I deprecated the practice of dilating the urethra for the removal of stone, as I had met with cases where incontinence of urine remained afterwards. I have, however, met with cases where the urethra was dilated without the slightest injury, and with no incontinence afterwards. But I have likewise been so unfortunate as to lacerate the neck of the bladder, in spite of all care, and without the slightest premonition. I have known the same accident to occur also at the hands of others. For the present it is only necessary to state that, as a means of diagnosis, it does not compensate the risk, and by conjoined manipulation, the anterior wall of the uterus can be quite as thoroughly examined from the vagina.

Unless we use the probe we cannot always be sure of the true direction of the uterine canal, nor of the relation of the uterus itself to external growths. It may be introduced while the patient is lying on the back, the finger guiding it to the os uteri. But I prefer to introduce it with the patient in the usual semi-prone position, after bringing the cervix into view, although it may be occasionally necessary to turn her again on the back. The mode of examination with the probe will be again referred to.

After completing the rectal examination, if there is still a doubt as to the relation of an abnormal growth to the uterus, Sims's elevator may be used, with the patient on the back; or we may defer its use until after the speculum examination. This instrument has already been described. It will be found useful for releasing the uterus from any neighboring mass with which it may be lying in close contact.

When properly used it gives the operator complete control over the position and movement of the uterus, and unless this is so much enlarged as to have little freedom of motion, a very accurate idea may be obtained of its surroundings and attachments.

MODE OF USING THE SPECULUM.

Bringing the cervix and the greater portion of the vagina into view, by means of Sims's perineal retractor, or speculum, depends less upon the manner of holding the instrument than upon the position of the patient.

She should lie on her left side obliquely across the table, with her lower limbs flexed, so that her head and knees will be near the edge of the table, to the right of the operator, and her hips near the lower angle on the opposite side. The under, or left, arm should be drawn out from under her, and flexed across the back, and the body rolled over on the chest as much as possible. This will necessitate the flexing of the upper, or right, thigh, until the knee comes in contact with the table, and it is, therefore, drawn up more than the under one. In this position the face is turned somewhat to the right, the head should be lower than the pelvis, and have only a small pillow under it. It is well to have the legs at the head of the table about three inches shorter than those at the foot; and there should be a foot-board, which can be drawn out when needed, to afford a resting-place for the feet and to allow the hips to be brought within easy reach of the operator.

When an operation is to be performed, or a minute examination is to be made, the clothing of the patient should be loosened about her waist. When this has been done the abdominal viscera fall away from the vaginal walls, and the vagina becomes fully distended by the entrance of air into it as soon as the speculum is introduced. In ordinary examinations this preparation is not necessary, for if the cervix is not exposed at once, it can be brought readily into view by other means. That there may be no unnecessary exposure the nurse should cover the patient with a sheet, tucking one end in between the legs to protect the upper buttock, while the lower buttock is to be covered by a napkin, which will also save the patient's clothing from being soiled.

As the nurse, with her left hand, draws up the right natis and labium, the operator introduces the instrument, well lubricated; his right index finger being held in the concavity of the speculum, for the purpose of giving it the proper direction in the vagina. After it has reached the hollow of the sacrum, the soft parts are to be firmly pressed back by the thumb and index finger against the instrument, which is to be thus held until it can be grasped by the assistant. If the speculum is held properly, it not only retracts the perineum, but it also helps to elevate the upper labium. The traction on the perineum should not be backward in a line with the coccyx, but to the right of it, and somewhat obliquely across the upper buttock. By placing the buttocks close to the angle of the table, the assistant is enabled to stand sufficiently behind the patient to steady the instrument. This is not to be done by traction, but by using the width of the hand, like a wedge between the buttock and upper edge of the speculum. The central portion or isthmus of the instrument lies against the flat of the hand, and the upper part between the thumb and index finger, so that the fingers are free, and can be moved without disturbing the position of the speculum. By thus using the hand as a wedge, the instrument can be steadily held in place for hours, during a long operation, without cramping the fingers. It promotes greatly the comfort of the patient to have the instrument held in this manner, and enables her to relax her muscles, which she cannot do if the perineum and rectum are irritated by the frequent jerking which occurs when traction is made by the fingers alone, without a resting-place for the hand, as I have described.

Unless the clothing about the waist has been loosened, the uterus will not always be brought into view on opening the vagina with the speculum, and even then it is often necessary to push aside the anterior wall with the depressor. When the cervix has been once exposed it will generally remain in view if drawn down gently, with a tenaculum, in front of the fold which has been depressed.

We should examine carefully the condition of the mucous membrane of the vagina and the cervix. From the appearance and quantity of the discharge we may form some idea of the extent and location of disease within the uterine canal. The more profuse the secretion, the more certain we may be that its source is below the internal os, and from the cervical portion of the canal. In every instance where the female has had an abortion produced, or borne a child, the cervix must be carefully examined for a laceration of some form, as lacerations are the most common cause of hypertrophy of the uterus. If an erosion exists, it will probably be a partially healed laceration, and must not be mistaken for what is commonly termed "ulceration:" it is but an excoriation, caused by the uterine secretions flowing over the parts.

When in doubt, after a digital examination, as to the direction of the uterine canal, this can be ascertained only by means of the uterine probe. This instrument should be given a curve in accordance with the supposed direction of the uterus, and while introducing it the cervix should be steadied by means of a tenaculum. If resistance to its passage is met with, it should be withdrawn to make the necessary change in its curve: and this should be done until it can be easily passed to the fundus. This will enable us to appreciate the exact direction and depth of the canal, without doing any harm to the patient. To obtain its fullest benefit, it is to be handled simply as a probe, being introduced always with care and great delicacy of touch. It is to be passed with as light a hand as a surgeon would employ in probing a gunshot wound; by so doing we may be able to detect changes in the diameter and other details of the surface of the canal.

In a word, we must feel with it as if it were a prolongation of the index finger, and if pain or bleeding is caused by its use, under ordinary circumstances, the result is to be attributed to faulty manipulation. A Simpson's sound is of no value in my hands for any purpose, and I have for many years abandoned it as a dangerous instrument. This will, doubtless, be regarded as a prejudice by many who think it useful; but let any one, not biased, train himself to use the probe, and he will be fully repaid for his trouble in finding a new method of observation open to him. When the uterus is very much anteverted or flexed, it is often difficult to pass the probe, and it will be necessary to give it two curves, one of which must be quite large, for the perineum would be in the way were we to attempt to introduce a straight instrument. When we are obliged to pass the probe through a tortuous canal, it is often necessary, after advancing a certain distance, to turn the patient on the back without removing the instrument. Then while directing it with one hand, we can change its curve, from time to time, by pressing it in the proper direction, against the side of the vagina or cervix, with the index finger of the other hand.

There are two conditions always to be borne in mind when we are about to pass the probe, and although they have already been referred to, the importance of the precaution warrants its repetition; BE SATISFIED BEFOREHAND THAT NEITHER PREGNANCY NOR CELLULITIS EXISTS. As to the first of these conditions, we may be in doubt, and must, therefore, defer the examination until the doubt is removed; and to overlook the existence of cellulitis is culpable. When there has been a recent attack of cellulitis, or if tenderness on pressure still exists in the neighborhood, the instrument should not be introduced. Again, with the finger, we may be able to detect the products of inflammation remaining in the form of thickening, but evincing no tenderness; in such cases the probe may be used with care; but we must scrupulously avoid disturbing the position of the uterus.

Many a poor woman has had to suffer from the carelessness of her physician in overlooking a latent cellulitis, and endured years of bad health, and often permanent sterility, from this disease, rekindled by the unskilful use of the probe or sound, extending beyond the limits of the first attack.

CHAPTER V.

CAUSES OF DISEASE, REFLEX AND DIRECT.

Influence of ganglionic or sympathetic system of nerves—Faulty nutrition—Uterine congestion and inflammation—Effect of increased weight of the uterus—Influence of the ovaries upon the uterine condition—Sub-involution—Constipation—Influence of fruitlessness and sterility upon growths—Difference between a fibroid and a fibrous tumor—Active exercise renders the uterus less liable to conditions arising from celibacy—Cancer and corroding ulcer—Atrophy of uterine body—*Accidental causes of disease:* 1. Products of inflammation and hemorrhage—2. Injuries of the cervix and displacements—3. Injuries of the vagina, and its outlet—4. Results of inflammation of mucous glands of the vagina, uterus, Fallopian tubes and ovaries.

During childhood, the female sexual organs are, as a rule, exempt from disease. But, from constitutional causes, exposure, or accident, inflammation of the mucous membrane of the vagina and outlet sometimes occurs. In rare instances, tumors of the ovary and uterus are developed before puberty, as a consequence of perverted nutrition.

The exciting causes of disease during the developing stage of puberty are an hereditary or acquired feebleness of body, causing absence or arrest of local development, and disorders of the nervous system from impaired general nutrition. The diseases of married life are to be traced chiefly to the consequences of sterility and to the accidents of child-bearing.

Just before and after the menopause, disorders of the nervous system are very common, producing a good deal of general functional disturbance, which continues until the sexual organs become finally quiescent; or until the morbid influences of any new growths that may exist shall have subsided. When all ovarian activity has ceased, and atrophy of the ovaries has taken place, the organs of generation become as in childhood, liable only to diseases of the mucous membrane from fortuitous causes.

The sympathetic, or ganglionic nerves are the regulators of organic life, and the great channels of nerve force through which function is maintained after all the elements of motor and sentient life have been brought into harmonious action. When in perfect action we have health, when impaired disease, and when their influence is suspended death ensues. It is sufficient for our present purpose to note their close relation with nutrition. To the smallest capillary, the blood-vessels are covered with a network of sympathetic nerve filaments. The sympathetic unquestionably excites the heart to increased action and the arteries to contract; but it is doubtful if the heart would have the power to drive the blood through the capillaries, unless aided by direct local stimulation of these nerve filaments by a healthy condition of the blood itself. If nutrition is impaired, the blood will be deficient in the elements essential to supply this stimulus, and, as a consequence, the circulation will become sluggish, and the venous capillaries distended. Therefore, when a condition exists which we are able to recognize as disease, we hold that impaired nutrition is the cause, and not the effect; that this depreciates the nerve force, and functional derangement follows. Or, conversely, from some unknown cause, this nerve force becomes insufficient to control organic life, and, consequently, nutrition begins to suffer before any actual disease is to be detected. We thus find that although nutrition is subordinate to the influence emitted from the ganglionic centres, yet, the two are mutually dependent, and the nerve force cannot be effective if wanting healthy function so long as nutrition is defective. When this mutual dependence is broken up, some form of local disease is likely to be established at the weakest point in the body, and this in women is commonly in the sexual organs. Beyond a certain point we cannot go in our speculations as to the exciting cause of disease. The essence of life, the commencement of disease and death, must ever remain beyond the limits of our appreciation.

Owing to our present want of accurate knowledge on many points of pathology, it has been found difficult to make any classification of the diseases of women which would be free from objection.

To illustrate my own views, I will assume, for convenience, that these diseases originate from causes to be attributed either to faulty nutrition or to accident.

In the first classification ("from faulty nutrition") may be placed those due to congenital and acquired causes. Under the head of congenital causes we may include an inherited feeble organization, arrest of growth and absence of development before puberty; since, doubtless, these do tend to render the female more liable to disease. The acquired causes of disease are to be traced directly to faulty nutrition coming on after puberty, the balance between waste and repair being lost, with the effect, as has been shown, of entailing organic and functional derangement. From this loss of balance there ensue disturbances in the circulation, producing hypertrophy or atrophy of tissues already formed, or the development of new growths, as tumors and malignant diseases.

Among the accidental causes are chiefly the various injuries of childbirth, and such as result from inflammatory action.

The girl is liable to the consequences of a feeble organization inherited from her parents, unless she be surrounded before puberty by circumstances well fitted to remedy the defect. Fortunately she is more likely to inherit the general physical tendency of her father as well as his intellectual force; but, as to her sexual development, she will certainly be more liable to uterine disease if her mother has been a sufferer in that direction. There are many exceptions to the rule, however, depending upon the relative ages of the parents as well as the age of the mother at parturition. The daughter, if the eldest child, is less liable to local difficulties than she would be if born after other children, when her mother's health may have already begun to suffer. The young girl with a feeble organization will, as a rule, menstruate for the first time at an early age, unless careful attention has been paid through childhood to the proper physical training. This precocity is commonly attended by undue nervous development, which is prone to lead to suffering at a later period of life on account of some derangement of the organs of generation, the result of faulty nutrition.

An arrest of uterine growth may occur in embryo without any corresponding arrest in the development of the ovaries; so that the cornua uteri may remain separated, or the vagina absent or imperfectly developed. But when the ovaries have reached a certain degree of development, the further growth of the uterus becomes dependent on them. Therefore, without the proper ovarian influence, the uterus will remain under size, although in shape it may be perfectly formed. The ovaries may have attained a state of development permitting of ovulation, yet, from want of perfect maturity of the ovules, the process does not supply the proper stimulus to the uterus, and arrest of growth may take place at any time prior to the full development of this organ.

Such defects in development are illustrated by the existence of a double uterus and a double vagina, a double uterus with a single vagina, or a single uterus with a double vagina. The vagina may be divided by a septum extending partially or entirely through its length; or an impervious partition may exist, as I have seen, across its

CAUSES OF DISEASE IN THE FEMALE ORGANS OF GENERATION.

- FAULTY NUTRITION.
  - Congenital—previous to puberty.
    - Absence of development in the vagina, uterus, or ovaries.
    - Defects in development, as double vagina and uterus, cleft of the urethra or recto-vaginal septum, want of proper development in the vagina as to shape, formation of flexures of the cervix.
    - Arrest of growth in the organism, partial development of the uterus or ovaries, separate cornua of the uterus.
    - An inherited feeble organization rendering the female liable to disease in after life.
  - Acquired—after puberty—from a loss of balance between waste and repair, leading to organic or functional disturbance.
    - Nervous disorders and reflex functional disturbance.
    - Development of new growth, as tumors of the uterus and malignant disease, from perverted nutrition.
    - Derangement in the circulation producing hypertrophy or atrophy of tissues already formed. Displacements and flexures of the uterine body.
- ACCIDENTAL AND INFLAMMATORY.
  - Injuries after childbirth, as vaginal fistulæ and inversion of the uterus.
  - Cellulitis, pelvic peritonitis, and products; hæmatocele, ovaritis, prolapse of the ovary, and growths external to the uterus, obstructing the circulation, either from inflammation, or by acting mechanically.
  - Formation of cicatricial tissue; induration of the cervix.
  - From violence.
    - Producing retroversion.
  - Mechanically.
    - After laceration of the cervix.
    - By closure of the os uteri.
    - Laceration of the perineum, and consequences.
  - Inflammation of the mucus follicles of the cervix, vaginal outlet, and Fallopian tubes.

diameter, forming with the hymen two closed cavities. There may also be a cleft of the whole urethra, of which I have seen but one case, and of the recto-vaginal septum with absence of the perineum, a defect in development not infrequently found. I may also mention a common defect in the shape of the vagina, the importance of which is not fully recognized: it is where the posterior cul-de-sac is absent, causing retroversion and subsequent flexure. An undue development in length of the cervix uteri at the expense of its width, is a common defect, from which either retroversion or a flexure of the uterine neck at the vaginal junction may take place. The defect in the shape of the vagina, and the misdirected development of the cervix are not infrequently found in connection with impaired nutrition, induced by the over-taxing or misapplying of the nerve force. Either condition may be found in the young girl who has broken down, after having succeeded in completing her education at a time when nature was making every effort to perfect the growth of the organs of generation. Such a perversion of nerve force—this building up of a brain out of season—will always entail a defect of sexual development. Whenever a young girl, during the developing period of puberty, or previous to its completion, has been burdened with care or responsibility, or whenever her nervous system has been over-taxed from any other cause, and at the expense of nutrition, there will always result some such perverted or arrested development. There is often an arrest of growth in the ovaries and uterus, as well as defects in their development, and nature enters many a protest before she ceases from her efforts to repair the injury. I have known many girls who commenced their menstrual life free from pain, and in good health, and did not suffer until after they had begun to impair their nervous system by over-study. A physical examination in these cases enabled me to detect a condition of flexure of the cervix, causing a dysmenorrhœa, which could not have existed at the beginning, as the menstrual flow was then free from pain.

In regard to absence of development, that of the vagina is the one most commonly found. It has been questioned if the uterus is ever entirely wanting, authorities holding that one if not both cornua always exist, at least in a rudimentary form. But I have met with a number of instances where it was impossible, by any means of exploration, to detect the slightest evidence of the existence of a uterus, and in these cases the vagina was always absent. I have never met with an instance where I could satisfy myself that the ovaries were wanting, since the general physical condition always indicated at least their partial development.

The effect of faulty nutrition, acquired after puberty from a loss of balance between waste and repair, will, to a great extent, occupy our attention as the chief factor, or exciting cause of disease. We will consider first the effects of derangement in the circulation, producing hypertrophy or atrophy of tissues already formed, and displacements and flexures of the uterine body.

Congestion produces fulness and expansion of the tissues, and may remain passive or result in inflammation, while a diminished supply of blood may cause atrophy. Arterial congestion, the result of local irritation, is always temporary in duration, passing away promptly when the irritation is removed, provided the reparative powers are in a state of integrity. Congestion, however, does not imply inflammation, although the latter cannot have a beginning without it. If the arterial congestion reaches a degree sufficient to set up inflammation, there will be instituted a distinct train of symptoms, consequent upon and secondary to the primary condition. It is all important in this relation to understand the difference between passive congestion, which is generally venous, and inflammation. These terms are usually regarded as synonymous, but erroneously so, as are many others which are used in uterine terminology. Inflammation always involves an infiltration of cellular elements into the parts, or a multiplication of those already there ; and this product may be recognized by an almost superficial inspection if it has not been absorbed. But we look in vain, after death, for any evidence of metritis or endometritis, or for ulceration of the cervix, as it is termed, for neither of these so-called conditions is inflammatory. On the contrary, in the conditions in which these are supposed to exist, the tissues are then blanched, the blood from the capillaries having passed into the larger vessels, as the heart failed to keep up the supply ; and there is to be detected neither loss of tissue on the surface of the mucous membrane beyond the epithelium, if even to that extent, nor any hyperplasm in the organ itself. Inflammation strictly speaking can exist only in an acute form, although its products may remain for an indefinite period. Therefore, the term chronic inflammation applied to the uterus is a misnomer, and only serves to give erroneous impressions of the pathology and treatment of uterine diseases. Inflammation of the uterine body never occurs except after parturition, and those conditions which are commonly held to be the direct results of inflammation are due wholly to obstructed circulation in the organ, caused by pathological processes in the cervix and neighboring parts. In this way are to be accounted for the so-called uterine hyperplasias with their attendant leucorrhœa.

The uterus, being an erectile organ, and surrounded by a mass of bloodvessels passing in every direction through the loose connective tissue of the pelvis, is directly affected by any increase or diminution in the neighboring circulation. We must appreciate the fact that in few other parts of the body have we such a network of vessels within the same extent of space. In consequence of the erectile character of the uterine tissues, these vessels in time become varicose, or over-distended, from continued obstruction to the circulation, and have an almost incredible venous capacity. As a stream will saturate the ground and lose itself in a marsh, so will the circulation through the pelvic cellular tissue, and, in diseased conditions will become equally sluggish. In attempting, after death, to inject the vessels in the pelvis of a female who has long suffered from uterine disease, it will be found that the distinctive form of the veins is frequently lost at different points ; and, with all care, the injections will become extravasated and diffused. With due allowance for the supposition that rupture would be likely to occur from an injection, when extravasation would not take place during life, it has been proved that these veins become gradually stretched at different points out of all form, and become mere receptacles. In this over-distended condition of the veins, their contractility is lost, and they are no longer able to return to the general circulation the same quantity of blood received by them from the capillaries.

The uterus will settle lower in the pelvis when it is increased in weight, and the traction which it induces increases the difficulty by still further obstructing the veins, which are more easily compressed than the arteries. Should the prolapse increase, the uterus by sliding forward in the direction of the vaginal outlet will become retroverted on reaching a given point, although it may have been anteverted in the beginning. When the obstruction has been confined to one side, so as to cause only lateral enlargement, the organ will become flexed upon the comparatively healthy side, but when the obstruction is limited more to the fundus (and it is the more common form) the flexure will be on the diseased side. As soon as the weight of the flexed uterus causes it to settle in the pelvis, the circulation becomes obstructed, with the same consequences as attend congestive hypertrophy alone. An anteflexure of the uterine body may exist, and, if the organ should become heavy enough to reach the proper point in the pelvis, the uterus will be retroverted, and even this version changed into a retroflexion.

The simplest form of congestive hypertrophy may be illustrated by the condition sometimes found in a woman who has never been impregnated, where it exists as if it were a protest on the part of nature, the true function of the uterus never having been fully called into play. Few unmarried women reach the age of thirty-five without suffering more or less from this condition whenever the function of nutrition becomes impaired from the nervous disturbance ; and this is likely to be the earliest manifestation. If nutrition improves, this condition disappears, and the system becomes reconciled, as it were, to the state of celibacy. When this equilibrium is not established, some permanent uterine disease is likely to be set up, generally in the form of a fibrous tumor.

We meet with congestive hypertrophy accompanying sterility, which is also a protest of nature. This condition will be found whenever the laws of nature have been persistently violated, by means taken to prevent conception, or where the act of intercourse has been improperly performed. The common cause is the use of the condom or other means by which the semen is excluded from the vagina, since its presence is doubtless the natural stimulus for relieving the congestion of the female organs of generation. Congestive hypertrophy also occurs in the female who has been the victim of an ill-assorted marriage, in prostitutes, and possibly in those addicted to self-abuse. Yet I must record the result of a large experience, to the credit of the sex, by stating that I have never met with a case of self-abuse in the adult woman, which could not be traced to disease as the cause and not the effect. I have met with instances of congestive hypertrophy due, I thought, simply to the fact that the female was a wife without the healthy influence of having borne children. In these cases no cause could be detected for the sterility, which, therefore, inferentially, could only be due to some defect in development, or to obstruction in the Fallopian tubes. The condition of the Fallopian tubes of course could not be determined, but ovulation certainly took place. In the absence of any positive knowledge, it was supposed that the process of ovulation in these cases was so imperfect as to fail not only to render conception possible, but even to generate a normal ovarian influence.

It may be claimed that the existence of passive congestive hypertrophy of the uterus is due and secondary to some abnormal condition in the ovaries. The ovaries, except during pregnancy, exercise, unquestionably, a very important influence upon the uterus throughout the sexual life of the female, without which it cannot fully perform its function. Yet hypertrophy of the uterus is often found to exist long before any abnormal condition of the ovaries can be detected. Ultimately, however, if the hypertrophy continues, disturbance in one or both ovaries will become manifested by pain and enlargement, and even prolapse may ensue, as a result of the uterine condition, at least this seems to be the case so far as we have any means of judging as to the cause and effect. These facts, and others derived from a long and close study of such cases, lead me to believe that the uterine nutrition and function cannot be dependent solely on the influence of the ovaries. The ovaries are able, doubtless, to perform their function in the absence of the uterus, while the converse is impossible, and thus the subordinate relation of the uterus to the ovaries is shown. Both are dependent for their nerve supply on the solar plexus, in common with all the abdominal organs; but I believe the view which has been advanced by some observer, that they are both under the influence of a special ganglion, will be found correct. But, although there may be under certain circumstances a mutual dependence upon each other, and, though both may be subordinate to a common governing influence, still a morbid condition may exist separately in either without necessarily involving the other.

The condition termed sub-involution, where the uterus remains too large after childbirth, is one due to faulty nutrition, the reparative powers having been checked in the process of removing the old material. The weight of the uterus acts as an additional source of irritation, as soon as the female attempts to exercise, and the hypertrophy is increased by a state of passive congestion. There are many of these cases in which the arrest of repair might be traced to the enfeebled general condition of the female, and due, therefore, strictly to faulty nutrition. But in my experience the number from this cause is by no means so great as is generally supposed, since the faulty nutrition is often the effect and not the cause. This will be treated of at greater length under the head of accidental causes, where the arrest of involution is considered to be due to the mechanical effect resulting from laceration of the cervix, and displacement of the uterus, in consequence of laceration of the perineum.

I have frequently met with congestive hypertrophy among females who had lived in some of the malarial districts of the Southern States. This enlargement of the uterus remained as one of the sequelæ of repeated attacks of intermittent fever after the condition of the general system had become impaired. The venous congestion of the pelvis and the enlargement of the uterus were brought about after the vessels had lost their tone, from the constant obstruction to the return circulation through the portal system.

Habitual constipation and errors in dress, causing obstruction to the venous circulation of the pelvis, will be found to be frequent causes of congestive hypertrophy of the uterus. The obstruction to the circulation is at first purely a mechanical one, but at length the coats of the vessels lose their tone, and, having become habitually over-stretched, are likely to remain in that state long after the cause is removed.

We will consider here briefly the development of new growths as the result of acquired faulty nutrition, due to the loss of balance between the waste and repair. So long as the uterus is kept properly occupied with its legitimate function, this balance is rarely lost. The female who has passed her life in a state of celibacy is more liable, after the age of thirty, to suffer from the development of a fibrous tumor than the sterile or the woman who has borne children, and the sterile more than the fruitful woman. At the same time, the female who has borne children is not exempt from these growths, but, as a rule, suffers after she has been rendered sterile from some other cause.

Thus, it would seem that sexual intercourse had a controlling influence upon the development of these growths, limiting them both in size and number. Such a growth, when single and isolated, may be called a fibroid, and when multiple, and a number together, a fibrous tumor. A single, or isolated, fibroid may become developed in the uterine wall of a sterile woman, but from the fact of her being a wife, such a growth will be held somewhat in check. The unmarried woman, however, leading a life contrary to the design of nature, has no such outlet for the nerve force which is being constantly directed to her uterus, and may therefore have many and large fibroids developed.

It should be mentioned that fibroids sometimes act as a mechanical cause of sterility.

If the unmarried female, from necessity or inclination, has had her nervous energies somewhat expended through other channels, as in a steady occupation of mind or body, the uterus will be less liable to suffer the penalties of celibacy. Thus it is that the servant girl, if well fed and protected from the effects of exposure, is far less liable to have a fibrous tumor or a fibroid, than a woman who passes her life under circumstances better fitted for the generation of nervous force, and is without proper channels for its expenditure.

The woman who has passed through the period of sexual life in perfect health, with all her superfluous nerve force fully absorbed in childbearing is, when a change of life takes place, more liable to suffer from perverted nutrition as expressed by the development of some form of malignant disease. Sarcoma may occur at any time during the active sexual life of a female, and, with but one or two exceptions, in the few cases I have met with, this condition has been preceded by a fibroid. In these cases the disease occupied the seat of the tumor, and originated, apparently, from some change in the tumor itself taking place, as the result of perverted nutrition. This disease is rarely found in the female who has borne children; at least I have never met with it except in the unmarried and sterile. Epithelioma, on the contrary, is found in the woman who has been unusually healthy, and who, as a rule, has given birth to a number of children beyond the average. I find from my note-books that in private practice I have never seen an instance of this disease in a sterile or unmarried female. All had been impregnated and borne children to full term except two, and these had suffered from criminal abortion early in life, and were sterile afterwards. In public hospital practice, however, I find recorded the histories of several females suffering from this disease, who claimed to be unmarried, and consequently would have denied a pregnancy. As there could have been no motive for deception among the class of cases treated in private practice, it may be accepted as a fact that epithelioma is rarely found in the female who has never been impregnated. Epithelioma and corroding ulcer are, as a rule, developed rather late in life—the latter generally before the natural cessation of menstruation, and the former after it has ceased. I have never met with a case of corroding ulcer before the age of thirty-five, but epithelioma I have seen, as an exception, as early in life as the age of twenty-three. From studying the histories of these cases I am impressed with the belief that the exciting cause may be traced to a local irritation, set up in consequence of injury resulting from childbirth, most likely from laceration of the cervix.

Atrophy of the uterine body and cervix begins to take place as soon as the ovarian influence is no longer emitted, *i. e.*, when the ovaries cease to perform their function. It is then, as we have already shown, that the influence of the sympathetic system, which has been secondary since puberty, begins again to be the governing power. When a change of life has been brought about under healthy influence, the nutritive instinct, as it were, is gradually diverted to other points of the body, and manifests its decadence in any part from which diverted by fatty degeneration of the tissues. Consequently, nutrition in the uterus is occupied no longer in the formation of new structure, but only in the removal of old material. It is then possible that nutrition may be misdirected in its attempt to remove the products of some previous injury, and the development of a neoplasm is excited, perhaps of the nature of epithelioma. As atrophy of the uterus is brought about, the amount of blood distributed to its tissues is greatly decreased, but that going to the mucous membrane itself, which is still to preserve, in some degree, its function, is increased for a time. The mucous follicles, or glands, gradually undergo cystic degeneration, and in turn become atrophied, or they disappear, so that the mucous membrane is at length greatly changed, by comparison with its former condition. Should the progress of this natural change in the mucous membrane be retarded or obstructed, as we have stated, by an injury which had been but partially repaired, it is not difficult to understand that an epithelioma might arise as a consequence of perverted nutrition. We see a marked difference between the development and progress of epithelioma and corroding ulcer. Either of these, and even cancerous infiltration of the pelvic tissues, may have a local origin or exciting cause, and afterwards acquire distinctive features by some accidental surrounding not always within our appreciation.

A tendency to new growth in the uterine mucous membrane of women who have borne children increases as they approach the period when the active life of the organ is to cease. Thus we find the mucous polypi more frequent, and granulations or vegetations more common at this time of life.

The nervous disorders and the reflex functional disturbances, which arise in consequence of local disease of the organs of generation, present a most important field for investigation. Our present knowledge enables us to recognize the general relation of cause and effect, but we are as yet unable to explain the fact why, with apparently the same local condition, a very different train of nervous symptoms may result, not only in different individuals, but in the same person at different times. Even a comparatively slight local irritation will frequently produce a marked disturbance of the brain or other portion of the nervous system. Again, the brain will react on the local condition to such an extent, that the influence of mental depression in some individuals over the progress of uterine disease is remarkable and quite evident.

In woman the ganglionic system is developed to a greater extent, both in the size of the ganglia and in distribution of the nerves, than in men, and consequently her tenacity of life and power of long endurance in resisting the effects of disease are greater. But this peculiarity renders her the more liable to reflex disturbances from ovarian or uterine disorders.

It has been shown that the ovarian influence, when normally exercised through the sympathetic system on nutrition, is a healthy stimulus to organic life; but when this stimulus has been impaired, or deflected as a consequence of local disease, there ensues at once some reflex functional disturbance elsewhere.

There are two great nerve centres which are the recipients, directly or indirectly, of all nervous irritation. The brain is the centre of the cerebro-spinal system, and the solar plexus, or abdominal brain, as it has been termed, is the centre of the ganglionic system. The spinal nerves enter the ganglia and convey back impressions to the spinal system, and through the latter they pass to the brain. As long as functional life is properly regulated, the ganglionic system is, as it were, a silent partner in the nervous circle, yet a busy one in maintaining nutrition. Each system, though complete in itself, is in close relation with the other, and the two, like the wheels of a watch, work harmoniously together only so long as each performs its proper function, and is undisturbed by extraneous agencies. Each system is in constant communication with the other, keeping up well-ordered and healthy action, and it is only in case of disorder that the sympathetic system asserts its potency for evil by transmitting the morbid impression through the spinal nerves to the brain. A recognition of the impression is at once returned from the brain to the special ganglion of the organ affected, and pain is expressed at the seat of distribution of its spinal nerve.

In the lower classes of animals the ganglionic system is fully developed without reference to the condition of the brain. A morbid impression originating in the organs of generation would be transmitted to the solar plexus and to the spinal system, but without serious reflex disturbance to the brain itself. But in woman, as a higher type of development, the brain is made to participate more or less in every disturbance in the ovario-uterine circle, and she is frequently a sufferer even when its function is normally performed.

But when the brain has been rendered morbidly sensitive by faulty education, lack of moral training, or by some previous mental shock, the whole force of any disturbance in the organs of generation is thrown directly on the cerebro-spinal system. We then have manifested certain forms of headache, unusual wakefulness, and change in disposition. A female will become irritable in temper, or eccentric; various degrees of hysteria will be developed, and every grade of mental disturbance even to insanity itself. It is in the woman who has not been trained to a sufficient moral restraint, exercised through her own will or other agencies, that the more marked forms of hysteria are met with. A well-drawn distinction should be made between hysteria, which can be held under check by a healthy exercise of the will, and other nervous disturbances which are really beyond the control of the patient.

When the hysterical development reaches a certain stage, and then passes beyond the control of the woman, we have catalepsy, or a condition with symptoms resembling coma, resulting from disease of the brain itself. Under other circumstances, the morbid state of the brain, in sympathy with the spinal nerves, is expressed by loss of motion, or by simulation of diseases of the joints and spine. Again, reflex irritation may be manifested through the cerebro-spinal system by disturbed muscular action, in the twitching of special muscles, by chorea, or by a first attack of epilepsy. The more marked the disturbance in the cerebro-spinal system, the greater will be the probability that the first cause can be traced to some error in the mental and physical training of the child, by which nutrition has been perverted, or turned aside from its normal work. We find these manifestations common in the unfortunate woman who has had her brain developed and overtaxed at the expense of her organs of generation; in those who give themselves over to luxury and idleness; in the victims of sentiment and romance; and, in an aggravated form, in those in whom that sheet anchor of womanhood is lacking, viz., a devotion to duty and a healthy sense of moral obligation.

The woman who has been trained to hold her emotions under a proper degree of discipline, or in whom they have been held in check by a healthy occupation of body and mind, does not necessarily escape every degree of disturbance. But when trouble comes the effect is transient, and she escapes the unhealthy reaction of the disturbed brain on the local disease of the organs of generation, which is often a serious complication. She will be more liable to suffer from some reflex symptoms traceable directly to the action of the solar plexus, or to experience some pain through the spinal nerves. Such pain may be expressed by tenderness on pressure at some point over the region of the spine, or in the organs of generation, about the lower portion of the abdomen and in the extremities. When the solar plexus is at fault the distress cannot be better expressed than in the words of an Irish woman, as "a weakness entirely," which means a sudden feeling of depression, coming on without any apparent cause. We find the stomach frequently sympathizing by reflex action, as evinced by nausea, disturbances in digestion, and dyspeptic headache. The action of the liver becomes deranged, the intestines are constantly distended by the accumulation of flatus, and occasionally there is diarrhœa. The regular action of the heart is often disturbed, and in fact there is no organ in the body which may not sympathize with an unhealthy condition of the female organs of generation; nor is there any portion of the body which may not, at some time, become the seat of neuralgia from the same cause.

ACCIDENTAL CAUSES OF DISEASE.

Under this head, in a general manner, have been grouped, 1st. What may be termed the products of inflammation, viz., those resulting from cellulitis alone, or those which follow the accumulation of blood in a hæmatocele situated in the neighborhood of the uterus, and which by displacing the womb, or by obstructing the circulation, has led to inflammation of contiguous parts; 2d. Injuries of the cervix, and displacements of the uterus from violence; 3d. Injuries to the vagina and its outlet; 4th. The result of inflammation of the mucous glands of the vagina, uterus, or Fallopian tubes.

Of all accidental causes, inflammation of the cellular or connective tissue of the pelvis, and especially that between the folds of the broad ligaments, is the most common; and next in frequency may be placed pelvic peritonitis and hæmatocele. These conditions are of far more frequent occurrence than is generally supposed by the profession. Often they are not recognized when existing, and their products, to be found long after the original disease has passed away, are almost uniformly overlooked. Their mechanical effect is to displace the uterus and obstruct its circulation, causing congestive hypertrophy, and often seriously interfering with the function of the bladder and rectum, by pressure. After the original condition has subsided, thickening and contraction take place, which will continue to act as a mechanical source of irritation to the uterus, and to defeat every effort for relief until the true condition is fully appreciated. For instance, after an attack of inflammation, one of the broad ligaments will become shortened, so that one or both conditions, thickening and shortening, will be a cause of irritation. Either the whole weight of the uterus will be thrown on the shortened broad ligament, thus keeping up the cellulitis on that side, or the traction on the opposite ligament will be sufficient to excite inflammation in its neighborhood. In either condition, or if both exist, no local treatment directed to the uterus alone can reduce its size, nor can it remove a flexure or heal any erosion which may have resulted from an attempt of the uterine vessels to relieve themselves of the effects of an obstructed circulation. The first step towards recovery will have been made as soon as the uterus has been lifted and held in a position in the pelvis where this traction and the obstruction to the circulation will be relieved. The effect also, on the bladder and rectum, will be to remove the reflex irritation they send to the uterus—a source often overlooked in the confusion as to cause and effect. Later in this work, when treating of displacements, this important subject will be carefully considered.

Inflammation of the ovarian structure will, in proportion to its extent, often act as a source of reflex irritation to the uterus, causing congestive hypertrophy, by obstructing its circulation, or by inducing its retroversion.

Sloughing from continued pressure of the child's head on the vaginal walls during labor, resulting in fistulæ, or loss of tissue with subsequent contraction, will often displace the uterus, interfere with the circulation, and cause much irritation to the bladder and rectum. The same cause and injury to the uterus often result in atrophy of the organ and permanent cessation of menstruation, even in early womanhood.

Inversion of the uterus will impair the general condition by causing a continued loss of blood, and by the drain of the accompanying leucorrhœa, but this condition seldom occurs directly from violence.

Violence, whether the result of rapid labor, or of labor prolonged until the parts have lost their natural elasticity, or of instrumental delivery, may be mentioned as a cause of laceration of the cervix and of the perineum, partially or through the sphincter ani. It will be seen hereafter, that laceration of the cervix becomes a most frequent cause of uterine disease, arresting involution through the irritation established by the separation of the flaps. Hypertrophy of the uterus is thus kept up and increased by this source of irritation, and an intractable form of erosion appears with an increased menstrual flow and an exhausting leucorrhœa in the intervals. As a consequence of laceration of the perineum, we find prolapse of the vaginal wall taking place from want of proper support; the uterus then becomes retroverted, and, in consequence of the obstruction to the circulation from its malposition, still further increases in size.

Direct violence, as from a fall, will frequently cause retroversion, especially if it happens that the bladder is filled with urine at the time of the accident. This displacement of the uterus, in proportion to the degree, is always attended by some obstruction to the circulation, which increases the size of the organ, and, if cellulitis follows, in consequence of the injury, flexure is frequently a result.

The most frequent effect of the formation of cicatricial tissue about the cervix, after inflammation or induration following the continued use of caustics or the nitrate of silver, is general nervous irritability, and neuralgia in different parts of the body. It is sufficient at present to direct attention to the fact that the cervix is covered with erectile tissue, and is therefore largely supplied with bloodvessels which are inclosed, as it were, in a network of nerves from the sympathetic system. Its structure fully explains the reflex irritation from which women so frequently suffer in connection with injuries and disease of the cervix.

Inflammation of the mucous membrane of the vagina, uterine canal, and Fallopian tubes, is caused by exposure to cold, by irritating discharges, violence, and specific poisons. From some unknown cause vaginitis and inflammation of the membrane of the uterine canal, not involving the deeper tissues, will sometimes, as has occurred under my observation, suddenly cease as by metastasis, and be followed by an attack of cellulitis or peritonitis. Simple vaginitis, as a catarrhal affection or when caused by irritative uterine discharges, is of little consequence apart from the temporary disturbance it entails. When the inflammation, however, has been produced by gonorrhœa, it is apt to involve the mucous membrane of the urethra, and may even cause cystitis, by an extension of the inflammation to the bladder.

According to the observations of Dr. Noeggerath[1] of this city, the secretions from the urethra of a man who has a stricture, the result of gonorrhœa, are of a sufficiently irritative character to establish inflammation in the genital tract of the wife, its favorite locality being in the Fallopian tubes. As a result of this inflammation there will be blocking up and narrowing of these tubes, and this he regards as a common cause of sterility. I have frequently seen this narrowing of the tubes without knowing its cause; and I have never met with an instance in which I could recognize its existence during life.

In all cases, however, of persistent sterility, it would be the duty of the physician to examine into the condition of the husband. If he should suffer from an extensive stricture, or to a slight degree from one near the bulbous portion of the urethra, the wife would remain sterile in all probability. The recurrence of a fresh attack of gleet in the male may set up a vaginitis in the woman, and this inflammation may extend progressively to the lining membrane of the Fallopian tubes. A severe vaginitis may, from some unknown connection, light up a cellulitis or peritonitis, and the ovaries may become indirectly involved. But the condition described by Noeggerath, in its relation to cause and effect, can only be determined after long observation.

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[1] "Latent Gonorrhœa, especially with regard to its influence on Fertility in Woman." Trans. of the Am. Gynæcological Soc., vol. i. 1876.

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CHAPTER VI.

PRINCIPLES OF GENERAL TREATMENT.

Confidence of the patient necessary to success—Influence of the mind over disease—Anæmia—Method of improving digestion and nutrition—Influence of sunlight—Influence of diet, etc.: coffee, stimulants, anodynes—Habitual invalids—Dress, Hours for meals, etc.—Importance of details.

THERE are certain general principles applicable in the treatment of all forms of uterine disease without reference to special indications. All forms of local disease of long standing are closely connected with faulty nutrition. Commonly there exists some impairment of the general health manifested by functional derangement with anæmia, and the local disease is kept up by a loss of tone in the pelvic vessels. The treatment is to be directed chiefly with a view to improving nutrition, and giving tone to the bloodvessels in the pelvis. It is necessary for success that the patient should receive careful general as well as local treatment. Both are essential, and the physician who neglects either will be disappointed in his results.

There can be no restoration to health in either the local or general condition, so long as anæmia exists, as the blood is then deficient in those elements by which organic life is properly sustained. In a case of long standing we will scarcely find an organ in the body which is not suffering from functional derangement. The connection of the various functions, as we have seen, is so intimate that the derangement of any one soon jeopardizes the integrity of all. The result is enfeebled digestion, a sluggish portal circulation, and imperfect respiration. The blood is no longer oxygenized properly, and it is returned to the general circulation in a condition not unlike that of a cold-blooded animal. The kidneys are over-worked, and the skin is inactive; repair, to a certain extent ceases, and general waste is the rule. In addition, we often see combined in the same subject, the pernicious effects of the habitual use and abuse of alcohol, anodynes, or coffee.

The first step in the treatment of every case is, if possible, to gain the patient's entire confidence. As the mind has so much influence over the body the sufferer must be impressed with the certainty of her recovery if the physician can conscientiously anticipate such a result. But he should never commit himself by stating the time necessary for restoration to health, since this must vary for each individual. The physician should never allow himself to be placed in a position where his truthfulness may be questioned by the patient. She will never forgive any attempt to deceive her by holding out false hopes, and when once her confidence has been shaken, but little further progress will be made in the treatment of her case. She should be taught to keep her nervous manifestations under strict control, for it is a healthy discipline, and as she should be encouraged and aided by her physician, this influence cannot be exercised if their relation be on too intimate a footing. He should be kind and forbearing, but just to himself in this respect, and without a show of sympathy.

Whenever a patient has become addicted to the use of stimulants, anodynes, or coffee, an effort must be made at once, without a compromise, to break up the dependence upon either of these insidious poisons to the nervous system. Their indiscriminate use having, in the beginning, aided not a little in bringing about the general wreck, to continue them would but defeat the best devised plan of treatment. I have rarely met with an instance where the patient was so far reduced that this could not be carried out; and in the end it causes little suffering. In private practice, at the house of a patient, this may be difficult. But in my private hospital, every woman who is addicted to stimulants or anodynes is kept under strict watch, since the most truthful person cannot be trusted when going through the ordeal of a recovery from the alcohol or opium habit. The profession has, indeed, much to answer for in the injudicious prescribing of such potent agents. Rarely, indeed, is there a necessity for the repeated use of anodynes, except during an attack of inflammation, or for some special purpose after a surgical operation, or for one suffering from the advanced stages of malignant disease. It is an easy mode of practice, but an unwarrantable one, to inject a little morphine under the skin, or to administer hydrate of chloral in order to save annoyance or the necessity of investigating the real or imaginary pains of nervous women. It has been my misfortune to see so much of the evil effects of this easily acquired habit, far more difficult to overcome than the original disease, that, for years past, I have abandoned the use of the hypodermic syringe. I rarely give opium in any form by the mouth, and only under the above stated conditions by enema.

The mode of administering anodynes by the rectum is the least disturbing to the digestion; it does not involve a rapid and constant increase of the dose; and it is one not likely to be resorted to by the patient herself. In private practice the case is almost a hopeless one from the hour that the patient becomes dependent upon the use of an anodyne. There can be no improvement afterwards in the powers of nutrition, and the nervous symptoms are all increased, so as to mask the true condition. The woman becomes a sufferer from opium neuralgia, or, rather, its habitual use brings about such an impairment or prostration of all her vital forces, that her power of endurance is lost, and every uncomfortable feeling is intensified into pain. The only hope of relief is to cut off the supply, as I have stated; and the physician in private practice is fortunate if he can secure the support of her friends to aid him in carrying out a course attended apparently with so much suffering and cruelty to the patient. It may be necessary to resort temporarily to the judicious use of bromide of potassium, and more nourishment should be given, and means adopted for improving the general condition.

Digestion can be aided but little, at first, by the use of medicines, and our chief dependence must be upon simple but nutritious food, small in bulk, and administered frequently and with regularity. As soon as possible, attention must be directed to bringing about a healthy action of the skin, by the use of hot-air baths, general friction, and frequent exposure of the body to the direct action of sunlight.

Facilities for taking a Turkish bath are to be found in most of the cities, and in the country some substitute for it can be resorted to. The use of hot air answers better for those suffering from anæmia than does the steam or Russian bath; while this is best fitted for the more robust. Exposure to the action of the hot air should not be prolonged, at first, beyond ten or fifteen minutes, which is generally long enough to cause the skin to perspire freely. The patient is to be then sponged off with water as cold as can be borne without producing a shock, thoroughly dried, and well rubbed from head to foot. She should then go to bed as soon as possible, take some beef-tea or other nourishment, and rest an hour or two.

A hot-air bath can be extemporized by the patient lying at full length on a cane-bottomed sofa, or several chairs, with a number of spirit lamps placed beneath, on as many large plates, the person and chairs being covered by blankets. I have often resorted to this plan when a patient could not be carried a distance to the public bath, and it answers very well. I direct two large blankets to be spread out on the floor, the row of chairs to be placed in the centre, with the spirit lamps under them. I first have the lamps lighted, and the ends of the blankets turned up over the chairs, until the air has been heated. It is, of course, necessary for the temperature of the room to be properly regulated beforehand, that the patient may be in no danger of contracting cold from exposure. She is then to be placed nude and at full length on these chairs or sofa, in a comfortable position, and with a pillow under her head. The ends of the blankets placed under the chairs are to be turned up over her and covered with a third blanket, leaving only her face uncovered, so that she lies directly on the perforated cane bottom with her body exposed to the heated air from below. At first, it requires the exercise of a little faith on the part of the patient that she is in no danger of injury, as the position is not unlike being on a gridiron over a fire; but the body is at too great a distance to be sensible of the flames below, and, if the lamps are properly placed, there will be no danger of setting fire to the blankets. As soon as the skin begins to act freely, the limbs and the body, in turn, are to be sponged off, well dried and rubbed. This can be done without the exposure of more than a portion of the body at a time, and each part can be covered with a dry blanket until the patient has cooled sufficiently to be placed in bed, or to have her clothing put on. When she is strong enough to help herself, she may envelop her body in the top blanket, and step directly into a full-length bath-tub filled with water at a comfortable temperature, after which she may be dried and well rubbed. This bath may be given two or three times a week, or, when the patient is strong enough, it may be given daily. With any improvement in the condition of the skin, and in a patient whose limbs are always cold to the knees, there will follow a relief through the circulation to the overtaxed kidneys and the portal system, and, indirectly, digestion will be aided.

We may learn much from the practice of the hydropathists, who often succeed in restoring the general health and improving the local condition, after others have failed to accomplish as much by the use of tonics and other remedies, when the patient has been unable to assimilate her food properly. Their practice is to envelop, or "pack," the body in a wet sheet, using warm water, and then to cover the body with blankets until a free action of the skin is established. Then a bath follows, with friction afterwards, and the method is an excellent one if the patient is able to take exercise.

The action of sunlight is beneficial in anæmic conditions by creating a tolerance of the stomach for the preparations of iron. The use of iron, in any form, and sunlight must go together, for, without the aid of the latter, ferruginous preparations are not properly absorbed by the stomach, and must act as irritants. It is often impossible for women to properly carry this out, for it is essential that the whole body should be directly exposed to the rays of the sun. Those who need it most are generally too feeble to be sent to establishments in the city fitted up with the necessary facilities, and, therefore, for a time at least, they must utilize the sunlight in their own rooms. The best period of the day is an hour or two before noon. The patient is to be placed in front of a window on a low lounge or sofa, covered with a blanket, so that she may protect herself from cold by enveloping the part of her body which at the time is not exposed to the sunlight. Unless the weather is very mild, and the room warm enough, it is safer that she should keep on her stockings, and, if solicitous for her complexion, her face can be protected by a veil, and her hands covered by gloves. If in cold weather, and the window should be near enough to the fire, she can lie on the floor with several blankets and a mattress under her, and have a screen to protect her from drafts and from observation. As long as she is not likely to take cold from exposure, or to suffer from fatigue, she may remain lying in the sun for hours, and without exposing her whole body at any one time she may, in turn, bring every portion into the light. This mode of treatment is most satisfactory in its results, and would be perfect if we could at the same time combine with it the benefit of fresh air. The patient will be fully compensated for all the annoyances which must necessarily attend this practice; but it must be persevered in for weeks, and sometimes for months. During the time of menstruation the patient may lie in the sun, with her clothing on, but should not run the risk of exposing her body to the cold. I know two instances in which the period was suddenly arrested by this exposure, and while the effect was likely due to cold, it is possible that the sun may have sufficiently disturbed the circulation and brought about the arrest, by diverting an increased quantity of blood to the capillaries of the skin. As soon as the anæmia is lessened to some extent, and the condition of the blood improved, the capillary action will become more vigorous, and the power of both assimilation and elimination will increase. We can then do more by medicinal means to assist digestion, and the use of tonics and preparations of iron may be resumed.

It is a well-established fact that, so long as the tongue remains coated, and the bowels overloaded, little or nothing can be accomnear the bulbous portion of the urethra, the wife would remain sterile in all probability. The recurrence of a fresh attack of gleet in the male may set up a vaginitis in the woman, and this inflammation may extend progressively to the lining membrane of the Fallopian tubes. A severe vaginitis may, from some unknown connection, light up a cellulitis or peritonitis, and the ovaries may become indirectly involved. But the condition described by Noeggerath, in its relation to cause and effect, can only be determined after long observation.

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We may learn much from the practice of the hydropathists, who often succeed in restoring the general health and improving the local condition, after others have failed to accomplish as much by the use of tonics and other remedies, when the patient has been unable to assimilate her food properly. Their practice is to envelop, or "pack," the body in a wet sheet, using warm water, and then to cover the body with blankets until a free action of the skin is established. Then a bath follows, with friction afterwards, and the method is an excellent one if the patient is able to take exercise.

The action of sunlight is beneficial in anæmic conditions by creating a tolerance of the stomach for the preparations of iron. The use of iron, in any form, and sunlight must go together, for, without the aid of the latter, ferruginous preparations are not properly absorbed by the stomach, and must act as irritants. It is often impossible for women to properly carry this out, for it is essential that the whole body should be directly exposed to the rays of the sun. Those who need it most are generally too feeble to be sent to establishments in the city fitted up with the necessary facilities, and, therefore, for a time at least, they must utilize the sunlight in their own rooms. The best period of the day is an hour or two before noon. The patient is to be placed in front of a window on a low lounge or sofa, covered with a blanket, so that she may protect herself from cold by enveloping the part of her body which at the time is not exposed to the sunlight. Unless the weather is very mild, and the room warm enough, it is safer that she should keep on her stockings, and, if solicitous for her complexion, her face can be protected by a veil, and her hands covered by gloves. If in cold weather, and the window should be near enough to the fire, she can lie on the floor with several blankets and a mattress under her, and have a screen to protect her from drafts and from observation. As long as she is not likely to take cold from exposure, or to suffer from fatigue, she may remain lying in the sun for hours, and without exposing her whole body at any one time she may, in turn, bring every portion into the light. This mode of treatment is most satisfactory in its results, and would be perfect if we could at the same time combine with it the benefit of fresh air. The patient will be fully compensated for all the annoyances which must necessarily attend this practice; but it must be persevered in for weeks, and sometimes for months. During the time of menstruation the patient may lie in the sun, with her clothing on, but should not run the risk of exposing her body to the cold. I know two instances in which the period was suddenly arrested by this exposure, and while the effect was likely due to cold, it is possible that the sun may have sufficiently disturbed the circulation and brought about the arrest, by diverting an increased quantity of blood to the capillaries of the skin. As soon as the anæmia is lessened to some extent, and the condition of the blood improved, the capillary action will become more vigorous, and the power of both assimilation and elimination will increase. We can then do more by medicinal means to assist digestion, and the use of tonics and preparations of iron may be resumed.

It is a well-established fact that, so long as the tongue remains coated, and the bowels overloaded, little or nothing can be accomplished by the use of tonics. I am often impressed with the conviction that there is no error so frequently made in the treatment of anæmic conditions as the neglect of occasional brisk purgatives in the form of some mercurial. Even those who are apparently in a most debilitated state are benefited thereby; and, although the prostration, for the time, may be increased, it is more apparent than real, and reaction is generally prompt. It is a marvel that blood-poisoning does not sometimes and even often occur in cases of habitual constipation, when we consider the almost incredible accumulation which often takes place in the intestinal tract, and the vitiated character of the secretions. This remarkable degree of tolerance is very fortunate in some respects; but unless the accumulations are removed, and the character of the secretions changed, there can be no improvement in the appetite. All means adopted to stimulate digestion—this condition remaining—must fail, and only add to the disturbance. By emptying the bowels thoroughly, and relieving the portal system, we effect a great improvement in the digestion, and, at the same time, remove the chief obstacle to the proper return of the venous blood from the pelvis, through the liver, into the general circulation.

Unless there exists some contra-indication, I generally adopt the following plan, as one of the first steps in the treatment of those who have long suffered as chronic invalids.

I direct half an ounce of inspissated ox-gall to be dissolved in a basin of warm water, and thrown into the colon by means of a Davidson syringe, while the patient is on her knees and elbows. The greater portion of this quantity of water can be introduced in this position if it be done slowly. By making firm pressure against the anus with a folded towel, the patient can be greatly aided in retaining the injection long enough for the ox-gall to exert some solvent action upon the indurated fecal mass. The patient, in all probability, will be much exhausted; nevertheless, after twelve hours, eight or ten grains of the mild chloride of mercury, one scruple of the bicarbonate of soda, and half a grain of ipecacuanha may be administered by the mouth; it is best to give this at bedtime. The soda will have the effect of increasing the purgative action of the mercurial far beyond what would result from its use alone. Its action will not be excessive, nor will an additional purgative be required. It will be found that more food can now be borne, and digestion may be aided by the use of some bitter tonic infusion. After a few days, should the tongue continue to be coated, it is a good practice to administer a scruple or more of ipecacuanha, and after the stomach has become settled to repeat the dose of calomel and soda.

The course I have pointed out is apparently a harsh one for a class of patients generally suffering from debility, yet it is almost always borne well, and in the end fully compensates for the temporary disturbance. Beyond question these cases are prostrated, and suffer from the condition which I have described, and cannot be relieved by mild means; but the impression made by the treatment above suggested is, as a new sensation, beneficial. Later it may again be necessary to resort to the same purgative or to a blue pill; but with a little care it will be easy to regulate the bowels without recourse to drugs, and then any tonic treatment will be followed by improvement in the general condition. Many of the mineral waters, with or without iron, may be found serviceable when taken before breakfast, for the purpose of acting on the bowels. The preparation long in use, and known as the Rigby mixture, answers well with many cases. It consists of an ounce or more of the sulphate of magnesia, dissolved in some seven ounces of water. The salt is converted into a bisulphate, and rendered more active by the addition of a drachm of dilute sulphuric acid. An ounce of the syrup of orange peel, with fifteen grains of the sulphate of iron, if needed, may be added, and from one to two tablespoonfuls in a little water is to be taken early in the morning. This combination is an excellent one, as it does not constipate after using it for any length of time, but may be left off and resumed again when needed. As with all saline purgatives, its action is rendered more prompt by some warm fluid, as a cup of tea, taken into the stomach shortly after the medicine has been administered. When the patient is unable to exercise, and there is a tendency to fecal accumulation, five grains of inspissated ox-gall, made into a pill, may be given three times a day, with a small dose of rhubarb and soda every other night. The habit of regularity must be established, and if necessary, the use of a small enema of tepid water can be employed to bring about the action at a regular time. It is often necessary to add strychnia, or some other preparation of nux vomica, to the various remedies used to regulate the bowels, for the purpose of exciting and giving tone to the muscular tissue of the intestines which has become gradually over-stretched; and, considering its well-known property of increasing the action of other medicines, a smaller dose of these can be used than would be necessary without it. Small doses of ipecacuanha in combination with other agents are often beneficial to promote digestion. From a quarter to half a grain, three times a day, increases peristaltic action, and improves the character of the secretions. It either has a tonic effect of itself, or it acts indirectly as a tonic, by increasing the action of that class of remedies.

It is generally a matter of experiment as to the preparation of iron best suited to the individual case, and more benefit is derived by a frequent change than from the long-continued use of any one preparation. Those in combination with the vegetable acids, as the citrate and tartrate of iron, are always borne if iron in any form can be taken. The tartrate of iron and potassa, from its tendency to relax the bowels, or rather not to constipate, is also an excellent preparation. When a change becomes necessary, the mistura ferri composita should be tried, than which we have few preparations of iron better fitted for giving tone to the organs of digestion. As soon as the stomach becomes tolerant to other preparations of iron, I generally resort to that time-honored one, the tincture of the perchloride, which, after all, is probably the most reliable preparation in the Pharmacopœia. After it has been made several years, and is in a condition in which it is usually thrown out by the druggist, it causes less headache, and is best tolerated by the stomach, owing to a certain amount of free acid which it then contains. It can be taken with a little water, in drachm doses, when ten drops of the recent preparation would not be so well tolerated; and, although the effect on the teeth is objectionable, this can be avoided by carefully using a glass tube, and afterwards the tooth-brush. There are various preparations of iron, recently manufactured, which can be given in an effervescent form—one always most acceptable where the digestive powers are not good.

The same rules of diet as would be applicable in general practice are to be followed, and the individual peculiarities of each case must determine the treatment.

Before a patient is able to take a certain amount of exercise, the food must necessarily be more concentrated, be given in less quantity and often, in the same manner as would be directed for a convalescent.

Until the patient becomes tired of it, an important article of diet is freshly-made concentrated beef-tea. Raw beef thoroughly rubbed up in a mortar, then seasoned and made into a sandwich, will be of service, until the tender-loin of a beef-steak can be digested. Milk and cream should be given in such quantities as the patient may be able to digest, and if a liberal amount of salt be added to the milk, it will be less constipating, and will be found to agree with most persons.

One great object in the use of concentrated food is to obviate any accumulation in the bowels, since the great difficulty generally is to keep the bowels regular while the patient is unable to take exercise. Purgatives cannot be employed all the time, and we have already noted the necessity of relieving the circulation in the pelvis by keeping the bowels free from accumulations.

It is advisable to administer cod-liver oil as soon as it can be borne without disturbance; if taken towards the completion of digestion, instead of just after a meal, it will remain so short a time in the stomach that it is not likely to disagree. An excellent substitute and one often better tolerated, is fat pork properly prepared. I direct a thick portion of a rib piece, free from lean, to be selected and allowed to remain in soak for thirty-six hours before being boiled, the water being frequently changed to get rid of the salt. It should be boiled slowly, and thoroughly cooked, and while boiling the water must be changed several times by pouring it off, and fresh water nearly boiling substituted. It is to be eaten cold in the form of a sandwich made from stale bread, and both should be cut as thin as possible. It is very nutritious, but it should only be given in small quantities until a taste for it has been acquired. It is the most concentrated form in which food can be taken in the same bulk, and I have frequently seen it retained when the stomach was so irritable that other substances would be rejected. For this condition of the stomach it may be rubbed up thoroughly in a porcelain mortar and then given in minute quantities at a time. It is made more palatable by the addition of a little table salt, and this will be well tolerated, while the salt used for preserving the meat having become rancid, if not soaked out, will produce disturbances in even a healthy stomach. I some years ago saved the lives of two of my children, who, on different occasions, were suffering from cholera infantum, by feeding them entirely on the fat of pork prepared in the way I have described, and, while nothing else would be retained on their stomachs, not only was it retained, but it also had a beneficial effect on the diarrhœa.

This would prove a most useful article for the sick and dyspeptic if we called it by another name; and as the prejudice against it is naturally great, the patient had better become accustomed to its use before learning any particulars as to its character.

I have frequently found coffee, even when taken weak, to exert a very deleterious effect in women who are suffering from uterine disease, in consequence of its indirect effect on nutrition, through its influence on the nervous system. When tea is taken to excess its effect is equally bad, since it likewise disturbs digestion, and destroys all appetite for animal food. Nutrition becomes so much

[illegible]

[illegible] two wineglasses of good claret, [illegible] taken with the principal meal in the mid-[illegible] a patient is very feeble. I sometimes order [illegible] with a fresh egg beaten up in it, to be given with a [illegible] breakfast. Stimulants are too frequently ordered to [illegible] empty stomach at bedtime, when a patient is habitually [illegible]. This I believe to be very injurious, since the digestion is likely to be deranged from it on the following day; and the practice cannot be continued, even for a short time, without establishing it as a necessity. It is better instead to give some light food, which, as digestion takes place, will often relieve the brain sufficiently to cause sleep. Unless the claret has some body, such as Burgundy possesses, it is liable to become acid, and, on this account, is better taken pure than diluted. These wines, by aiding digestion, improve rapidly the quality and quantity of the blood, while the use of whisky is of little if any benefit in this respect.

To relieve the sudden and distressing sinking sensation, due to deficient action in the solar plexus, and to which females suffering from any uterine disorder are so liable, a camphor mixture, comp. spts. of lavender, aromatic spts. of ammonia, or the ammoniated tincture of valerian, will be found to answer better than any stimulant of an alcoholic character. As soon as the patient is able to exercise in the open air, all stimulus had better be discarded, unless there should exist some reason to the contrary, and reliance be placed on the good effects of fresh air and sunlight.

On the administration of anodynes there remains but little additional to be said, beyond reiterating the necessity for exercising great caution in their use. Giving these remedies to relieve the many bad feelings and sleeplessness of nervous bed-ridden women is a great error in practice, since their use but adds to the difficulty, with the certainty, almost, of creating the habit of dependence upon them. These symptoms are but the outcries of nature indicative of the want of fresh air, sunlight, and a better regulated circulation of the blood; so that every step taken to afford the patient the benefits of these essentials is made in the proper direction. The different means already suggested must be employed, and, to improve the condition of the circulation, the surface of the body and extremities are to be frequently and thoroughly rubbed. Rubbing and mild massage can be very advantageously employed to relieve the restlessness and wakefulness of a person unable to exercise. Other local means will be referred to hereafter, but this method must be employed to an extent sufficient to cause the patient to fall asleep from sheer fatigue. The combinations of bromine, or iodine with potassium, calcium, or ammonium will be found most useful for internal administration. Some light but concentrated food given at bedtime, after a thorough rubbing, will often produce a good night's rest, and this is further advisable, since the whole night is often too long a period for many patients to fast. We must, then, by one substitute or another, gain time and avoid, if possible, the resort to chloral or opium in any form.

Unless the patient be suffering from inflammation, as from an attack of cellulitis, where rest is essential, she must be gotten out of bed and into the open air as soon as possible. There never was a greater fallacy in practice than to place in bed a woman suffering from uterine disease, with the expectation that she will recover her health by remaining there. The loss of tone in her general condition will be greater than any benefit to be gained from the confinement, even when combined with a well-judged course of local treatment. She will not be confined long in bed before her general health must become so far affected as to make her more sensitive to all nervous impressions. At length, if an attempt be made to sit up, the actual suffering, produced by the blood gravitating into and again distending the vessels, will cause her to desist from the attempt. After having remained in the horizontal posture for a length of time, the vessels of course diminish greatly in calibre, being relieved of the weight of the column of blood. When assuming the upright position, these vessels are again distended, and few patients have the courage to persevere, since they always attribute the suffering to the continued existence of the local disease. Women are sometimes able to remain for years in bed without their general health apparently suffering from the confinement. This degree of tolerance, however, is not brought about until a stage of acclimatation (adaptation), as it were, is gone through with, during which time the general health suffers. In the end, the local disease may improve, or even disappear on account of the rest, yet, in spite of an improvement in the general health, the patient will remain an invalid, and she will have already contracted the habit of being sick. This is the history of becoming a confirmed invalid, and it often has its starting point in the ignorance, the indifference, or the want of an honest purpose of the attending physician. We may charitably attribute the result to ignorance, in the greater number of cases, and to a degree of ignorance which would not be tolerated in the practice of any other branch of the profession. There is a stage in the progress of nearly all diseases of the female organs of generation, developing in early life, which, if recognized and properly treated, may end in a complete restoration to health.

A young girl should never be subjected to a physical examination without the fullest indication of its necessity, nor should the examination be made by one incompetent to judge fully of what is to be ascertained. Nevertheless she is not free from liability to local disease, the result of accident or imprudence, and as she may, for example, have a fall producing retroversion of the uterus, or by getting her feet wet, suffer from an attack of local cellulitis, the medical man in charge would be culpable if, through fear of his inability to make a diagnosis, or from indifference as to the result, he should withhold an investigation on the plea of her youth. Instances are common in which such cases are neglected at the beginning, for the reason assigned, and in which the assurance is given that relief will be obtained by rest and time. Too often the fulfilment of the promise is not made good, and the patient comes to be a confirmed invalid, and to depend on the use of stimulants or anodynes. Let us suppose the case of a young girl seized with dysentery, whose physician, after directing that she should be kept quiet, were to make no further investigation out of respect to her modesty, but should allow the case to drag on until it was thought that she was old enough for an examination. Let it then be found that the dysentery had become chronic, with ulceration and thickening of the whole colon. Should the responsibility of the physician cease in the case when he advises the patient to consult some one who had paid more attention to such diseases than he had? But no physician would allow the disease to go on without informing himself as far as possible of its cause, and he would employ every means at his command, and act on the advice of others, to check its progress. Such results of ignorance or neglect are often met with in gynæcological practice; and the cause which I have supposed in this instance is only one of many equally simple, which are capable of laying the way open to grave disorders. We may also call attention to the evil consequences of failure to fully investigate the case, not only of young girls but of women of any age. Often time is thus lost, and the patient even rendered incurable, by the mistaking of a symptom for the disease. Can we cite a more common instance than that of the retroversion, when the displacement is frequently never suspected, and months are lost in attempting to treat the first and only condition detected in the case, viz., a supposed ulceration on the cervix, a lesion of little consequence, and one which would likely disappear on correcting the displacement, and restoring the circulation in the organ? The bad health of many a woman has begun in a simple displacement, and ended in her becoming bed-ridden from recurrent attacks of cellulitis, or from the irritation extending to one of the ovaries, producing enlargement and prolapse.

There are many instances where women have become bed-ridden in consequence of too much importance being attached to the local condition, by the physician, or in consequence of his failure to check by the exercise of a stronger will the growing tendency on the part of the patient to chronic invalidism. These women are always most intelligent and plausible, but have a full development of the nervous element. After a certain time has been spent in bed no amount of argument will make the slightest impression; in fact the physician is helpless, since every point he may take will be ably refuted. I have been consulted by cases of this description when not the slightest evidence of any uterine disease could be detected. Yet they would continue to remain bed-ridden until a fortunate fire, a fit of anger, or some other powerful stimulus, brings by accident the relief they have not been able to obtain. Notwithstanding this subject has already been treated of at great length, its importance will justify the recital of two instances, which, among others, have passed under my observation, to illustrate how much may sometimes be accomplished under favorable circumstances.

Several years ago I was sent for to see a young married lady, residing in the western part of this State, who had been a helpless invalid, and confined to her bed for some five years. I made my examination about nine o'clock in the morning, but with great difficulty on account of her apparent feebleness. In fact she would have deferred the examination on account of her condition, were it not that great importance had been attached to my visit, which had been unavoidably put off several times on account of my business. I was surprised to find no uterine difficulty except a slight degree of retroversion, and the organ rather lower in the vagina than natural—certainly nothing to keep her in bed, as there was not the slightest tenderness to be detected by the finger at any point. I was puzzled to make up my mind as to what course to pursue, for I was satisfied that if any local disease had ever existed it had gotten well without her being aware of the fact. I felt that it was necessary to get her out of bed, without the mortification of knowing that no local disease existed, and that I would fail if she were told the true condition. It was Sunday; I was obliged to remain until night before the arrival of the train; it was in the country and in the midst of a snow-storm; there were some eight hours at my disposal, and I determined to devote the day to her case, and see what could be accomplished by force of will, after gaining her confidence. I first entered into the fullest detail of her past history, but could elicit from her little more than monosyllables. I then branched into literature, science, and the arts to the fullest extent of my knowledge, but at the end of two hours I had apparently made no impression, and was almost in despair of being able to find any subject of common interest to us. At length a casual remark about autographs promised better, for I then learned that in the garret there was stored away a collection made by her a number of years before. I had it hunted up, and soon found that I was making progress. I gradually got her interested sufficiently to induce her to rest on her elbow, and tell me all the particulars as to who the local celebrities were, and under what circumstances each letter had come into her possession. After I had talked steadily for more than two, and she for three hours, we had become the best of friends, and I began to think of getting her up to dinner. I suddenly asked, "Are you not now relieved of that feeling of great pressure from which you have suffered so long?" With an expression of surprise, she said, "Why, yes, entirely so." "That is just as I expected," I remarked, "so we will send for your maid to get you ready for dinner, since you are not going to let your husband and myself dine alone when you are so much relieved." "Doctor, are you serious; do you think that I can get up?" "Certainly, I know that you can; and for what purpose did I come from such a distance, but to relieve you?"

I had her limbs thoroughly rubbed, clothing hunted up, and then assisted her into dinner. She occupied a seat alongside of me, and I exerted myself to the utmost to keep her interested, and the conversation from flagging. After the lapse of half an hour I saw that she was too much exhausted to remain up longer, although she was making every effort. She remained lying on the sofa for an hour or two, and then, at my suggestion, walked with the aid of her maid up and down the entry for a while, "to test what I had done." When I left the house for the train, she waved a farewell to me from her bedroom window. Two weeks afterwards she walked into my office in New York, and has since been well.

This case was one in which the physician supposed some local disease existed, and had insisted on her remaining in bed. Her general health soon began to suffer; she afterwards regained her strength, but the habits of an invalid were then so confirmed that she continued bedridden. Fortunately for her she had an exaggerated impression of the importance of my visit, and was prepared almost for the performance of some miracle as the result of my skill. Yet, withal, I should have accomplished nothing, but for the fortunate circumstance of the autographs, by which I was enabled to get under the shell and gain her personal confidence.

With the history of this case before us, it will not be out of place to refer again to the absolute necessity of gaining this personal influence over a certain class of patients before any great advance can be made in the treatment. It is not sufficient alone that the patient should have every confidence in the skill of her physician, for, in certain conditions of the nervous system, it will avail little without the personal influence. There lies the great difficulty, and one often insurmountable, of ever gaining this influence, through either confidence or fear, over a patient treated at home, and surrounded by sympathizing friends. I have labored for hours and days, without the patient being conscious of it, to gain this influence and to create a feeling of dependence. With it comes, on her part, the firm conviction of her recovery. As I study her peculiarities, I gain a more accurate knowledge of the inner woman than she herself possesses, by getting at the deep under-currents which may have been running away, through the greater part of her life, and to the detriment of her nervous system. She, herself, will give me all the information I need, with the confidence of a child, yet afterwards, will credit me with a degree of penetration undeserved, but with the effect of adding greatly to my influence. To attain this point fully repays the physician for his labor, since the patient then loses sight of herself, and is only anxious to carry out his views without question, and simply because he wishes it. This influence enables a patient to keep her nervous feelings under a healthy discipline, so much so, that nothing would mortify a patient in my private hospital more than for me to doubt her powers of self-control. This influence is not to be gained by any degree of intimacy or sympathy, but rather the contrary. When necessary to accomplish it, I aim to gain absolute and entire control over the patient, to understand every thought and motive, and to direct her as a child. Those who suffer from hysterical disturbances or other nervous disorders cannot be properly controlled and directed without the exercise of this influence by a will stronger than their own. I have met with other instances where they have become intensely selfish and wilful, so much so, that no influence could be exercised over them, except through fear, and to get them out of bed is an act of kindness, in the end, even if it becomes necessary to employ force.

About eight years ago, a young unmarried woman was brought to me from one of the New England States, through the advice of Dr. Wm. H. Van Buren, of this city. She was moved on a stretcher, with great difficulty, and had been confined to her bed for some four years. She had indeed become a skeleton in the house, from the amount of attention she required, as she was unable to feed herself or move without help, and would only sleep at night with the gas burning brightly, and with some member of the family to sit up with her. Moreover, she was so wilful, that to annoy those in charge of her, she would sometimes deliberately have a movement of the bowels or empty her bladder in bed. When I attempted to examine her, she persisted in keeping her limbs rigid and straight out, she would not answer a question, and lay with her eyes shut. By watching the expression of her face, I judged that every portion of the vagina was painful on pressure, and yet I was not sure but that she was enjoying a little spiteful pleasure in misleading me. I, however, could detect nothing wrong, except that the uterus was rather larger than natural, and very much anteverted. The father, mother, an aunt, and several members of the family were anxiously waiting to hear the result of my investigation. They had come prepared to spend the winter, and be on the spot while the patient was under treatment. This circumstance embarrassed me more than the condition of the patient, but I quickly determined on the course to be followed. I told the father that I had found out the difficulty, but it was necessary that I should not enter into any further particulars, and, to enable me carry out my plan, he and his family must return home by the next train, and without taking leave of the daughter. If they did this, I felt certain that I could cure her, and if unwilling, they must seek the advice of some one else. As I went on, attending to my business, they remained staring at me in a state of surprise and indignation, and did not make up their minds as to the course to pursue until the last moment in time to take the train. I went up to see her afterwards, and found her lying with her eyes closed as I had left her. I remarked, " Well, you are now fairly in the hands of the Philistines, for your father, mother, aunt, and all of them have returned home without even bidding you good-bye, and I have now got you entirely in my power." I saw that I had made an impression, but she soon recovered her self-possession. I told her all in the house were but parts of a machine, with no thought beyond carrying out my instructions. That I was a very devil when roused, and bade her look at me well, and see if she did not think I was fearfully in earnest. I noticed that her eyelids slightly parted, as curiosity tempted her to see if I was really what I represented myself to be. I continued, and stated that as long as I had my own way I was as gentle as a lamb, but I would give her fair notice that she would live to regret it if she ever deviated from my instructions. " To-morrow," I said, " at ten o'clock, I will begin to the office, and you must be dressed at that time. and if you are not dressed, I will play the lady's right hand, for it will be a very busy part of the shall remove that nightgown, and put on your flannel I then slowly enumerated, in order, every article could think of, even to a napkin. This was too and she opened her eyes, saying "You are a brute. that her meals should be placed alongside of her might feed herself, but I believe she ate nothing. She until she could be civil, she would be left to herself as At nine o'clock her gaslight was turned out, and she waking several times in the night, as the nurse passed in the passage-way. In the morning, I learned from she evidently intended to brave it out, and that nothing be done with her. At ten o'clock I entered her room, had failed her at the last moment, on hearing my she was wildly trying to pull on a stocking under the I saw at a glance that I had conquered. I spoke to her lie down, and said that I was glad to see she had mind to help me, and as she was still fatigued from her would rest until the next day, but that then she must be the day she was quite friendly with the nurses, and the I found her dressed with their aid. I gave her my arm to the elevator, helped her into the office, and made a tory examination. She remained for half an hour on a arlor, and then I allowed her to return to her room. In he was out riding in a carriage, soon she was able to d at the end of a month she returned home well. She much attached to me in a few days, and I never had a le patient. The treatment consisted in hot-water vaginal ly, several applications of iodine over the whole vaginal was also well rubbed twice a day, from head to foot, had air and sunlight she could get, and some medicine to bowels.

k of being tedious I have entered more into a detailed ese two cases than at first glance might seem called for. between the two cases was very great; and it was necesplan of treatment should be different. The first patient d all the characteristics of her sex, and through a sense ht at any time have made the effort to throw off the invalid. At least she would not wilfully have refused to listen to advice, although she may have felt satisfied, she could not follow it. But, with the last case there was but little more than the instincts of the animal left, for she was not moved through any sense of modesty, but from fear, as she acknowledged afterwards, that she thought I looked as if I might spank her. I was aided through the helpless condition she felt herself in, alone among strangers, and through fear of punishment she was conquered. But after she had once yielded, and all were now kind to her, it was not necessary for me to tell her to make the exertion, for she knew that I wished it, and this excited a desire on her part to prove herself worthy of my confidence. In a kind manner I had quietly pointed out to her certain serious defects which it was advisable for her to correct. The effort then made by her to carry out a purpose in overcoming her temper, and subjecting herself to this self-discipline, brought out all the good traits of her character.

To carefully watch for and check any disposition on the part of the patient to fall into the habits of an invalid is quite as much a part of the duty of the physician as to prescribe for her general health, or to treat her local condition. Unless there should be a necessity for remaining in bed, the physician should insist upon the patient being regularly dressed every day, not to remain in a wrapper or dressing gown, but to complete her toilet as if she were going out. Let it be the exception to the rule when breakfast is taken in bed, for this is a bad beginning for the day. When the patient is unable to go to her meals, at least require that the breakfast shall be served in another room, even if she has to be carried there, that in the mean time her own may be properly aired. So long as this discipline can be enforced the probabilities of becoming bed-ridden will be kept in abeyance. I have often accepted, with no little satisfaction, the addition of an extra ribbon or bow to the toilet, or the wearing of a trim breakfast cap as a hopeful promise for the future. Let the patient then dress herself each day as if she expected to receive visitors, and even be encouraged to put on her best to make her appearance as attractive as possible. In my hospital I sometimes insist on this being done as a matter of respect to myself. Notwithstanding the exertion is a fatiguing one, it occupies the patient's mind, and will impart a healthful impression to the effect that she is not as sick as she would feel were she to remain in bed. The difficulties to be overcome seem, sometimes, almost insurmountable in carrying out any plan of discipline as has been advised. Yet it is beyond question the duty of the physician to persevere in the effort to the end, and even if a compromise dent, it will be found, I am satisfied, that the great cause of disease in women is to be traced to the effect of exposure, the result of insufficient clothing. It will have to be the work of time before the public can be educated to realize the necessity for a change in the dress of women as well as in that of children. The subject should specially engage the careful attention of the physician who has in charge a patient suffering from any disease of the class under consideration. This is the more necessary, since in sickness the system has less power of resistance than in health, and every means must be availed of to improve the capillary circulation, so that the tendency to obstruction in the larger vessels may be removed.

In winter a flannel shirt and drawers of the same material, to be worn next to the skin, are essential. In warm weather a lighter flannel shirt can be worn, but it should never be wholly dispensed with. At night, the flannel worn through the day should be exchanged for a fresh garment, and, although one of a lighter material may be used for the night, it should be wholly laid aside only by one in health. The drawers ought to be closed below the knees in winter by an elastic band, but in summer they may be open, and made of cotton. Linen is totally unfit for our climate, even in the warmest weather, and I never allow its use at any season, but have cotton at once substituted. Woollen stockings are necessary in cold weather, even when the woman is confined to the house, since the floor is always the coldest part of the room, and the feet are exposed to draughts. If appearances are to be regarded, the compromise should be in covering the coarser stockings with a pair made of finer material. The use of cotton or silk will answer in summer if the woman is not so feeble as to suffer from cold feet at that season. Thin-soled slippers are inappropriate for an invalid, even for use in the house, since the feet are not properly protected unless the slippers are lined, or made of cloth. Too much care cannot be given to the proper protection of the feet, and the soles of the shoes should not only be thick enough to keep the feet dry, but also warm. To the absurd habit, and one too common among young women, of walking out in low shoes, and with soles only fitted for a ball room, may be traced much of the cellulitis with its consequences, and the sterility of after life. A flannel petticoat is now universally worn in winter, but it is seldom long enough. Its use in summer should not be dispensed with except in very warm weather, and then it should be put on again in time to be a protection should the weather change. A better plan is to wear around the lower portion of the abdomen, throughout the summer, a single thickness of a flannel bandage, wide enough to reach from the hips to the umbilicus, and which can be secured with tapes. It may be cut bias so as not to cling so much to the body, while at the same time it will be more elastic. The disinclination to wear flannel is entirely due to habit, for the heat is rarely so great in our climate but that a light flannel may at all times of the year be worn next to the skin, not only with comfort, but as a most valuable means for the preservation of health. The object is not to keep the surface of the body bathed in perspiration by an excess of clothing, but covered by flannel of a sufficient thickness to keep the skin active, and at the same time protect it, at all seasons of the year, from sudden changes. In women it is particularly essential to protect the lower extremities, for as long as the feet are cold there will be an increased quantity of blood in the pelvic vessels. Whenever a patient is suffering from congestive hypertrophy of the uterus, or of one of the ovaries, or has still the remains of an old cellulitis, she will inevitably experience an increase of pain about the pelvis whenever the feet become cold, and even before she has been made conscious of their condition by any other sensation.

The selection of a room to be occupied by an invalid should be made with the view of obtaining the greatest amount of sunlight and a good outlook. If it can be avoided, there should be no wash-basin, connected with the sewer, in the room, nor a water-closet in the neighborhood, since women who are debilitated from diseases of the genital organs are particularly susceptible to the poisonous influence of sewer-gas and malaria. As long as the patient is able to leave her room, she will be able to find occupation for both body and mind. But when unable to do so, every means must be employed with the view of breaking in upon a life which can be but a monotonous one under the most favorable circumstances. With this object, it is necessary to move the furniture and pictures frequently, not only from one part of the room to another, but to substitute others when practicable, and even the position of the bed should be frequently changed.

Whenever the system has become weakened, the strength of both body and mind must equally suffer. A woman in this condition can rarely be restored to health by any local treatment, or by tonics and some attention to regulating the bowels, yet this is the course generally followed. It is really necessary to give occupation to both body and mind, that her life may be modelled in accordance with an explicit course directed by the physician. The main object is to bring about the utmost degree of regularity in all her habits, by which course alone we can hope to effect a change for the better in the function of nutrition. Moreover, from the well-recognized influence of the mind on the body, in these diseases, it is equally essential that it should be kept constantly occupied under such influences as are the most conducive to health. It is a serious complication for a physician to have in charge a woman, from the upper walks of life, without occupation or tastes that may be so directed as to afford her some congenial employment. Among the poorer classes this is not so necessary, since the brain is less active, and with them it is more a question of rest, better diet, and time.

The hours for meals should be designated, that for dinner being placed between one and two o'clock. The hour for retiring should not be later than ten o'clock, and, as a woman, even in health, needs more sleep than a man, she will require at least nine hours. The amount of exercise to be taken must be regulated each day by the physician, in accordance with the progress made, and the special nature of the treatment; except in summer, the best hour for exercise being about noon. Even receiving friends, reading, and employment in needle-work, drawing, or any other occupation, I am obliged frequently to insist shall be done at some stated hour. But when I find a patient appreciating the necessity of regularity, and anxious to occupy her time properly, I prefer to leave the details to herself, as an additional source of occupation. The great problem, in nearly every case, which will tax both the skill and patience of the physician to solve, is to regulate the bowels, with the least resort to medicine, and to establish habits of regularity. A regular hour must be settled upon for the movements of the bowels, either in the morning, or at night before going to bed. Many of my patients find the hour of bedtime the most convenient, especially when they are obliged to resort to the use of an enema. By having a night of rest afterwards, they are spared the fatigue which many experience for hours after the bowels have been moved in the morning. I have also met with several patients who only slept well when the bowels had been emptied just before going to bed.

As the treatment of the diseases of the female organs of generation embraces, in some form, the whole field of the practice of medicine, it is not possible to do more than to offer general suggestions bearing on the more prominent features. For the successful treatment of these diseases, a more general and accurate knowledge is requisite than in the practice of any other branch of the profession, since, through the influence of the sympathetic system, as we have already seen, reflex irritation and remote functional disturbances are the rule. The advocate for either general or local treatment exclusively, or he who neglects to give the proper attention to both, does not possess sufficient practical knowledge to extend his usefulness beyond the range of an empiric. The successful physician or surgeon is eminently noted for his personal attention to details. The most profound knowledge adds but little to the success of practice if the details are not looked to, and many a brilliant operation has failed, and even entailed disastrous results upon the patient, for the want of proper care in the after-treatment. The purpose of this chapter has been, and the object in view throughout the work will be, to impress the reader with the fact that *success in the treatment of the diseases of women lies wholly in attention to minute details.*

CHAPTER VII.

LOCAL TREATMENT.

The condition of the circulation in the pelvis—Its influence on local disease—Must be corrected before any permanent advance can be made—The effects of electricity, cold, and heat in exciting contraction of vessels through reflex action —Hot-water vaginal injections; history and mode of use.

It has been stated that the sympathetic system of nerves presides over nutrition and the sexual organs, and that every bloodvessel, to the minutest capillary, is covered by a network of its filaments communicating directly with the ganglia. When nutrition is impaired, the bloodvessels lose their tone, and dilate for a want of proper nerve stimulus.

From various causes, already cited, the veins of the pelvis become gradually over-stretched, and finally lose their tone to such an extent that almost a stasis of the blood takes place; at least to such a degree that we may compare the circulation in the pelvis to that existing in a marsh which is saturated by a stream of about the same capacity on entering and leaving it, but which maintains a condition approaching stagnation between the two points. As a consequence of this venous fulness there is increased size and weight of the organs, causing an augmented secretion. Whenever we are able to improve the general condition of a patient suffering from disease of the organs of generation, the local condition also improves to a limited extent; and any increase of strength renders her better able to withstand the constant drain which nature seems always to set up in intelligent effort to relieve the congestion. But no permanent improvement can take place, in the local condition, until tone has been restored to these vessels, so that the circulation may be as little impeded in the pelvis as in any other portion of the body. We may by rest, or by restoring the uterus to its proper position, lessen its size, and by the same means, aided by local applications, at length heal an erosion, as well as lessen the discharge from the uterine canal and vagina. But the case will relapse, and at the end of a few weeks or months after the patient has begun to exercise, the original condition will have been reproduced. It is only by exciting reflex action through the nerves that the vessels can be made to contract, and as nutrition improves a permanent improvement in the tone follows.

We have three agents for exciting reflex nerve action, viz., electricity, cold, and heat.

Electricity exerts a decided effect during the time of the passage of the current, but the impression is transitory, and the agent is only to be relied upon as a valuable adjuvant to other measures.

Cold is a prompt excitor of reflex action by which the vessels are made to contract, but on reaction taking place the parts will become more congested than before, both the arteries and veins being distended.

Heat, unless at a temperature which would destroy the parts, does not act as promptly in causing this contraction as either electricity or cold: In fact its immediate effect is to cause relaxation, and to increase the congestion of the parts; but if its application be prolonged, reaction ensues, and contraction takes place; in other words, the reaction from heat is contraction. Under the increased nerve stimulus the capillaries are excited to contract, this effect extending also to the coats of the larger vessels, and as their calibre becomes smaller the congestion is diminished. The popular belief is that heat relaxes and increases the congestion of parts, and such indeed is the case at first. But a hot poultice is never applied with the object of increasing the congestion, but, as any "old wife" would express it, to draw the "fire" or inflammation out; in other words, it lessens the congestion by stimulating the bloodvessels to contract. That such is the effect, from the prolonged use of a poultice, is familiar to every one, and is well shown by the blanched and shrivelled appearance of the tissues after its removal. The hands and arms of a washerwoman, when in hot water, become swollen at first, from the increased flow of blood to them, but it is a well-known fact that they afterwards become markedly shrivelled.

Placing the hands in cold water at once causes the skin to shrivel, as the vessels are stimulated to contract, but we know that reaction promptly comes on, and a larger quantity of blood returns to the parts than was driven out. But, after soaking in hot water, the skin does not recover its natural appearance for hours, since the capillaries remain contracted. In their return to the natural state the reaction does not go on to a paralysis of over-distension, and hence there is no subsequent congestion. The immediate effect of cold upon the capillaries, therefore, is contraction, and with reaction comes dilatation; but the reverse is true of heat, which causes at first dilatation, followed by contraction.

With these practical facts before us, we resort to the prolonged use of hot water, by vaginal injections, to gradually bring about the required contraction and tone in the pelvic vessels. Whenever inflammation exists, there is essentially a congestion of the arterial capillaries; and when it subsides, there remains, among other results, a condition erroneously termed chronic inflammation: a condition essentially the same as the one just described, attended with a loss of tone in the vessels and an obstructed circulation, but it is a misnomer, since it is found where no previous inflammation has existed. The usual seat of the so-called inflammation, and the circumstances under which it is generally found, have already been stated, as well as the fact that what we have chiefly to deal with is the direct result of a loss of tone in the venous circulation throughout the pelvis.

The use of hot water vaginal injections is equally beneficial in all those conditions which constitute the various forms of disease in the female organs of generation, and which are amenable to any treatment other than a surgical procedure; and equally so, whether the congestion be venous or arterial. This remedy is not to be considered a "cure-all," but one of the most valuable adjuvants, under all circumstances, to other means. Yet, so beneficial is it, except in displacements of the uterus, that I believe more can be accomplished in the treatment of the diseases of women by its use, and a carefully regulated plan of general treatment, than by all other means combined.

After a vaginal injection has been properly administered, in accordance with the directions given on page 51, the mucous membrane will be found blanched in appearance, and the usual calibre of the canal lessened, as after the use of a strong astringent injection. As the patient lies on the back, with her hips elevated, the blood will be aided by gravity in its return to the heart, and the veins will be rapidly emptied, sufficiently to relieve their over-distension. In this position, also, the vagina will be kept fully distended by the weight of the water, and only the surplus amount can run off into the bed-pan beneath. The hot water will then be in contact with every portion of the mucous membrane under which the capillaries lie. The vessels going to and from the cervix and body of the uterus pass along the sulcus on each side of the vagina, and their branches inclose the vagina in a complete network. The vessels of the fundus, through the veins of which the blood flows to the liver, and back into the general circulation, communicate freely, by anastomosis, with the vessels distributed to the body and cervix below. If, then, we are able to cause the vessels of the vagina to contract, through the stimulus of the hot water, we can, directly, or indirectly, influence the whole pelvic circulation. It is most important to appreciate the necessity for elevating the hips, by which plan so large a portion of the venous blood becomes drawn off by gravitation. If the stimulus of the hot water is then applied, so as to cause the vessels to contract still more, we will, for a time at least, have the pelvic circulation reduced almost to a natural state. In order to allow the contraction to be as prolonged as possible, I generally direct the injection to be given at night, in bed, just as the patient is ready to retire. Thus, by constantly causing these vessels to contract, and by resorting to every other means of lessening the supply of blood in the pelvis, we will succeed eventually in securing a proper vascular tone. No plan of treatment could be more rational, or appeal more forcibly to sound judgment. But, unfortunately, owing to a neglect of details, it is rare that the slightest benefit is derived from the use of these injections, although so many years have elapsed since the profession has been fully informed as to their mode of action.

For fifteen years at least, I have been experimenting by different methods in the use of hot water, and have had during that time as large a number of cases as would be likely to be at the service of any practitioner, and I have arrived at the conclusion that it is an impossibility for a patient to properly give these injections to herself, so as to derive their full benefit. Not the slightest advantage is received from them when administered with the patient in the upright position, or, as is the usual method, while seated over a bidet; for, given thus, the water does not dilate the vagina, but escapes directly along the nozzle of the syringe. I have found that the best mode of all is to have the injections given while the patient is placed on her knees and elbows or chest. In this position we have the assistance both of gravity and the pressure of the atmosphere to empty the pelvic veins, while the water is able to act on a much larger surface of the vagina than it is when the patient is in any other position. But this position is a difficult one to assume, since those who are in the greatest need of hot water have not the strength to remain in it long enough to secure the full benefit; and considerable difficulty is also experienced in keeping the patient dry. This latter, however, can in a measure be overcome by using a funnel-shaped receptacle, with an India-rubber tube attached to the smaller end, the two sides being indented sufficiently to enable the patient to retain it in place by keeping the thighs together. I have also used an inclined plane to elevate the hips; it should come up between the legs, and have a hole large enough for the buttock, so that the water may flow into a receptacle below. These methods, or any other which the ingenuity of the physician may suggest, can be employed, so long as the action of gravity is brought into play, and the vagina is fully dilated by the water. But for the largest number of cases, the position on the back, with a bed-pan to elevate the hips, will be found the most convenient. Few women are so situated as to be unable to get some one to administer the injections properly, and the inconvenience of soliciting aid is a trifling one considering the benefit to be derived from it; and experience has shown that, unless the details can be carried out fully, the process only involves a waste of time, and a tax on the strength of the patient.

The temperature and quantity of water are to be varied according to circumstances. When treating the early stages of inflammation, it is necessary that the temperature should be elevated rapidly from that of blood-heat to 110°, or to as high a degree as can be borne by the patient, and that the injection should be often repeated. For ordinary use, a gallon of water two or three degrees above blood-heat is generally sufficient, but the temperature must be maintained at the highest point by the addition of hot water from time to time. The hour of bedtime is generally the best in which to seek for the beneficial effects of hot water upon the local irritation; for prolonged vaginal injection, at a high temperature, will often, when given by an experienced hand, act with more promptness than an anodyne, in allaying the nervousness and sleeplessness of an hysterical woman. I have frequently known a patient, after being well rubbed, and having received an injection, to fall asleep before the nurse had completed the process, and to be so overcome with drowsiness as to be but little disturbed when the bed-pan was removed.

In rare instances, and from a condition I am unable to explain, cases are met with where a sense of weight and an uncomfortable feeling are experienced about the pelvis after an injection of water at the usual temperature. In some instances so much disturbance resulted, that occasionally I was obliged to discontinue its use. But I have long since ascertained that the injection is well borne in these cases at a lower temperature, generally about 95°, and that after a week or two the temperature can be gradually increased.

This "cooking process," as it has been slightingly termed, is rendered easier by the use of ivory, or some other non-conducting material for the nozzle of the syringe, since the patient suffers more discomfort from the heated metal surface of the ordinary nozzle coming in contact with the outlet of the vagina than from any degree of heat in the water which it is advisable to employ.

To the injection (generally to the last pint) may be added, glycerine, chlorate of potash, chloride of sodium, carbonate of soda, borax, Castile soap, sulphate of copper, muriate of ammonia, brewer's yeast, permanganate of potassa, carbolic acid, or any other remedy which may seem to be indicated.

As the patient improves in health the quantity of water for the injections may be lessened, and the temperature gradually lowered to about 60°, and then discontinued. But for some months it would be prudent for a few days after each period to resume the injections at a degree or two above blood heat, and to have recourse to them whenever their use should seem indicated to counteract the effect of any imprudence.

In the summer or early autumn of 1859, during the temporary absence of Dr. Sims, I was operating at the Woman's Hospital to close a vesico-vaginal fistula, where it was necessary to free the tissues behind the ramus. The progress of the operation had been greatly delayed in consequence of oozing of blood, which I had checked by pressure and pieces of ice, but, on resuming the operation, in a few moments reaction would take place, and the bleeding became as great as before. The late Dr. Pitcher, of Detroit, was present, and suggested that I should dip a sponge probang into hot water and apply it several times to the surface; I did so, and to my surprise, the bleeding was promptly arrested. His explanation was, that, as the clot formed in the mouth of a vessel dilated by the heat, it would be so firmly held by the contraction of the vessel, when reaction took place, that secondary hemorrhage could not occur. He then stated to me he had been in the habit, for many years, when operating, of applying to a bleeding surface sponges taken from water as hot as could be borne.

From the earliest days of my study in this branch of surgery I have been skeptical as to the part inflammation was supposed to play in the diseases of women. Since I first had an opportunity to form an opinion, my views have been essentially what they are to-day, and I have taught the same for years at the Woman's Hospital, as is well known. In fact, my views were formed from watching the practice of others at so early a date, that I have never applied a leech to the uterus, or scarified the cervix with the view of reducing inflammation. Dr. Pitcher's suggestion made a deep impression on me, but it required years to appreciate its full import. But, having once realized the influence of heat as an excitor of reflex action, it became the means of clearing up for me many points in pathology, and hot water has proved a most important agent in my hands in the treatment of the diseases of women. At the time my attention was first drawn to this subject the universal practice was the use of the vaginal injections of cold, and even iced-water. I began to use tepid, and then warm water in my private practice, but at first my opportunities for personal observation were limited. However, from September, 1862, when I was placed in charge of the Woman's Hospital, to the present time, nearly every patient coming under my care in this institution, as in private practice, has been treated by this method, the quantity and temperature of the water being varied according to the peculiarities of each case.

Yet, I do not claim to have been the first person under whose direction a vagina was ever washed out with warm water; but I do claim to have been the first to use the agent in a systematic manner, for the treatment of the diseases of women and to have done so with a definite purpose, in keeping with what I considered to be sound pathology.

In every theory of inflammation congestion is, of course, considered a prerequisite stage, but the congestion is commonly supposed to be arterial, and all plans of treatment are directed to overcome this condition. So far as I know I may justly claim to have been the first to teach, that congestion of the pelvic tissues and organs, under ordinary conditions, is venous, and due to loss of tone in the vessels from impaired nutrition. This naturally led me to elevate the hips, so that, by the action of gravity, the congestion might be lessened, and then I applied hot water to bring about a further contraction of the vessels by reflex action, which would lead gradually to a permanent restoration of their tone and calibre.

CHAPTER VIII.

PRINCIPLES OF TREATMENT CONTINUED: DISPLACEMENTS, PELVIC CIRCULATION, LINING MEMBRANE OF THE UTERUS, APPLICATIONS TO THE UTERINE CANAL.

Proper position of the uterus—The essential principle is to remove obstruction to the uterine circulation—Positions either too low or too high are objectionable—Campbell's pneumatic repositor—Chronic inflammation and ulceration do not exist—Remedies: Nitrate of silver—Carbolic acid—Glycerine—Iodine—Use of applicator—Powdered substances—Pith of corn-stalk—Sponge-tents to reduce size of uterus—Injections of Churchill's tincture of iodine into uterine cavity—Hot water in the uterine cavity—Blisters to the cervix—Hyperæsthesia is not inflammation.

If the views which have been advanced as to the condition of the pelvic circulation, attending diseases of long standing in the female organs of generations be correct, it becomes evident that it is of paramount importance that the uterus should occupy a position where its circulation shall be without obstruction. When the uterus is displaced backward, forward, or to either side, the displacement is generally recognized, and an attempt is made to maintain it by some mechanical means in the upright position. But the true principle for correcting the various displacements is seldom fully appreciated. In general terms, it may be said that there is no common standard by which to determine the proper position for the uterus in all women, but that in each individual there is a point, or plane, in the pelvis which the uterus should occupy when she is in a state of health and not pregnant.

We are all familiar with the fact that the uterus is frequently found extremely anteverted, yet the woman may be in perfect health and suffer not the slightest inconvenience. The same is true of retroversion, although this may entail sterility, and the position, from mechanical causes, may render her more liable to some complication; yet, until this does occur, she may pass through life unconscious of the mal-position. Of course, it is advisable to correct a retroversion if possible, but I hold that it is not so much the position which is to be corrected, as it is the obstruction to the circulation in the organ which is to be removed. The uterus may occupy a position in the axis of the pelvis which might be faultless, by comparison with any accepted standard, yet the disturbance may be as marked as in an extreme case of version, should the organ occupy a lower plane in the pelvis than is normal. As soon as the uterus settles to a plane below the health line, as it may be termed, the tissues will be put on the stretch sufficiently to compress or obstruct the veins, while the arteries will not be affected. This is just the condition in pregnancy when, from the settling down of the uterus, the veins become distended to an enormous size. As the organ grows, the additional weight continues to add to the difficulty, by inducing congestive hypertrophy. With pregnancy, the obstruction to the circulation is relieved a short time after quickening, and the vessels are able to regain their natural size, but towards the close of gestation the venous circulation is again impeded by the upward traction.

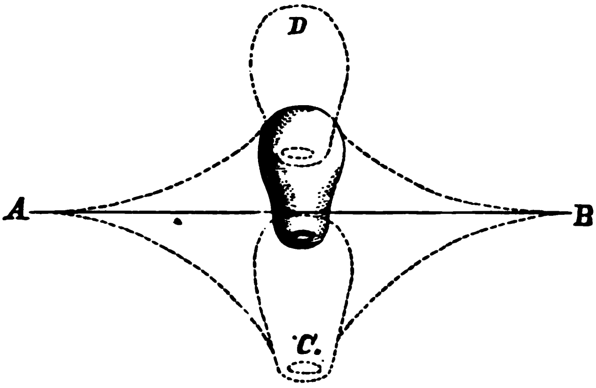
While writing, I recall the history of a case sent me by Dr. Woolsey Johnson, of this city, which shows the importance of recognizing the existence of this health line. I mention the doctor's name in connection with the case, from the fact that he watched the progress of the treatment closely, and was familiar with all the details. When I made my first examination, nearly every portion of the vagina, as well as the cervix, was extremely sensitive on pressure, and the pulsation of large vessels could be felt at different points. This condition had existed to some extent for several years, having followed a severe labor with the first child, but had been much worse after she had worn a pessary, which it had been thought necessary to introduce. The uterus was about four inches deep, and very much anteverted. She of course suffered with backache, difficulty in standing or walking, and leucorrhœa. I recognized the importance of lifting the uterus in the pelvis, but with the sensitive condition of the vagina, a pessary at the time could not have been tolerated. To a certain point, she improved rapidly from the use of hot water injections and the application of iodine over the vaginal surface. During a subsequent examination, the patient lying on the back, I lifted the uterus gently on the end of my finger, to judge whether its mobility had been lessened by the remains of an old cellulitis, which existed behind and to the left of the organ. At a certain point she remarked that the backache was relieved; the uterus was then lifted higher, but with a return and increase of the pain; it was then allowed to settle again, with relief, and a return of the pain was experienced as the organ reached its usual low position. I then slowly and gently lifted the uterus again to a plane in the pelvis at which the pain ceased. At this point I held the organ for some ten minutes, giving her great relief, and at the end of that time the pulsation in the arteries had ceased, and the quantity of blood in the veins diminished. This was done day after day, until she was able to go for a longer interval before returning pain and discomfort rendered it necessary to be repeated. The uterus decreased in size, the tenderness in the vagina became less, and at length she was able to wear, with comfort, a pessary, which held the uterus in its proper place in the pelvis. Notwithstanding that she suffered from two attacks of pneumonia and one of dysentery, within a year, and that her general health was much impaired before she came under my charge, she is now essentially well of her local difficulty. The treatment consisted in the injection of hot water, properly administered, daily, and in her placing herself, on her knees, and letting the air pass into the vagina to lift the uterus whenever she felt the necessity for doing so. Dr. Johnson, at the same time, looked after her general health. The uterus was lifted to its proper place, and a pessary was fitted, which she continues to wear; iodine was applied occasionally to the vaginal walls, and pledgets of cotton saturated with glycerine were frequently placed in the vagina. No application of any description was made to the uterine canal, for fear of lighting up the old cellulitis.

The practical lesson to be drawn from this case is that the cellulitis was, in all probability, caused by a pessary which lifted the uterus too high in the pelvis, above its natural position, by which the connective tissue was put on the stretch. Involution of the uterus had not been perfect, and from the obstruction to the circulation due to the cellulitis, the size of the uterus had been increased so as in turn to be an additional source of irritation. But the most important feature of the case is one which has been already referred to, and will again be considered at length. The greater portion of the weight of the uterus was suspended from the shortened broad ligament which had been the seat of a previous cellulitis, so that the circulation through both the arteries and veins was obstructed. The arterial congestion rendered the parts more sensitive, and brought about a condition which made her liable, on the slightest provocation, to a fresh attack of cellulitis, while the venous obstruction increased the hypertrophy, and caused the profuse leucorrhœa. As soon as the uterus was lifted in the pelvis to a point where the drag on the tissues, which had been previously inflamed, ceased, the circulation at once became restored, and the pain was relieved.

This case illustrates an effect resulting from one of the commonest errors committed in practice—that of lifting the uterus too high in the pelvis. Many an expert succeeds in fitting an instrument which will prevent the uterus from becoming again retroverted, but often fails to appreciate the plane or height at which the uterus should be held in the pelvis.

Let the line A B (Fig. 39) represent the line or plane which the uterus occupies in the individual when in a state of health, and at a point where the blood flows to and fro without obstruction. By some accident the uterus becomes displaced, and has its circulation so obstructed that by increased weight it at length prolapses, or sags, to the point C, and causes so much disturbance that the patient will seek advice. The general idea is to correct the difficulty at once by elevating the uterus well in the pelvis to the point D, it being a natural impulse to correct every extreme by going remote from it. But just in proportion as the uterus is lifted above the health line A B, we will have the same effect produced as existed when it was in a state of prolapse, below the line. This is the reason why, after fitting an instrument, the uterus is so often found to have increased instead of being diminished in size. Another result will also be observed, as an effect of obstructing the circulation, namely that the leucorrhœa and discharge from the uterine canal will increase, and an erosion soon form on the cervix where it had not previously existed.

Fig. 39.



The normal or health line and displacement.

We have already considered the action of gravity called into play by elevating the hips, and the influence excited by the presence of the atmosphere, in connection with gravity, when the patient is placed on the knees and elbows for the purpose of receiving a vaginal injec-

[illegible]

[illegible]

[illegible] the same [illegible]

[illegible] necessary [illegible] expelling a sub- [illegible]

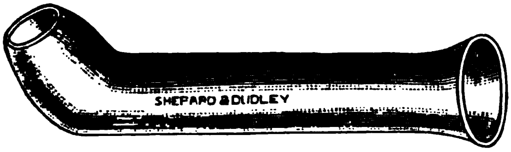
[illegible] carrying out the plan [illegible] and through the vagina. [illegible] women who had not borne children.

[illegible] and Treatment. N. Y. Medical Record of [illegible] and Transactions of the N. Y. State Medical Society for 1871.

and with the unmarried or stout women, it was often impossible to open the vaginal outlet by means of the fingers.

This difficulty has now been entirely overcome by an instrument (Fig. 40) devised by Prof. Henry F. Campbell, of Augusta, Ga.

Fig. 40.



Campbell's "pneumatic repositor."

It consists of a glass tube open at both ends, slightly bent, with a rounded extremity, which admits of easy introduction of both the instrument and air into the vagina. The device is so simple a one that it is remarkable its use had not suggested itself, since I was familiar with Dr. Sims's former practice of leaving a tube in the vagina, after an examination, for the free passage of air, as the patient changed her position, as otherwise it might escape with a noise as if from the anus.

I use the term "on the knees and elbows" as the one commonly employed in the Woman's Hospital, but it is in effect the same described by Dr. Campbell as the "genu-pectoral position," since the practice has always been to bring the out-spread elbows as well as the chest and side of the face in contact with the table at the same time.

We are now to consider a portion of the subject in regard to which the opinions held are so dissimilar, that there exists no foundation on which a conservative practice can be based in keeping with both extremes.

If the so-called ulceration of the cervix be accepted as a cause and not as an effect, the use of caustic applications is a consistent practice, and should be persevered in until the surface has been healed. But if it be held that the increased secretion is simply an attempt of nature to relieve an obstructed venous circulation, and that the erosion is a surface from which the epithelium has been washed away by the discharge constantly flowing over it, then such a course of treatment is to be deemed not only irrational but most hurtful.

A whole generation of physicians has been misled by the delusion of *chronic inflammation and ulceration* of the uterus, conditions which no one has yet been able to demonstrate on the dead body.

When an erosion has been healed by caustic applications, the health of the woman improves rapidly, since, for the time, a great leak has been stopped, by which she was constantly pouring out her life-blood in the form of leucorrhœal discharge. But, as the primary cause is not removed, the erosion must return again and again, until at length, if the treatment be continued, every mucous follicle will have been destroyed, and no further discharge can take place; but the hypertrophy of the uterus and the abnormal condition of the pelvic circulation will remain. If the application be strong enough to produce a slough, then, of course, the mucous follicles will be destroyed; but even if milder means, as the use of the nitrate of silver, be persevered in long enough to heal the surface, the damage will be quite as great, since the tissues will have been rendered sufficiently dense to cause atrophy of these follicles, and, after either mode of treatment, the tissues become essentially cicatricial in character.

The effect of such applications to the cervix, is more marked than when made to the canal above the internal os. The cervix is covered and its canal lined by a highly organized and perfectly formed mucous membrane, so that if its vitality is impaired, reflex symptoms of irritation are made most manifest, with a train of symptoms due to contraction of the os and canal. From the observations of recent writers it is questionable if a true mucous membrane, or any lining membrane at all, exists above the internal os, for what seems to be a membrane may simply be an outgrowth from the muscular tissue which is constantly renewed. It is, therefore, irrational to make a caustic application to a surface which cannot long exist in a state of disease, independent of the tissues beneath, and we cannot hope to arrest a discharge until the whole surface has been seared over. As the profession has for years been familiar with the effects of the cautery and caustics on mucous membranes in other parts of the body, it is remarkable that their use should still be continued in the treatment of the diseases of the female organs of generation. Yet conscientious men of our day, after the use of the cautery or caustics, will leave a surface on the vagina or cervix to heal by granulation, and will deny that the surface thus formed is cicatricial, or that it ever contracts; and I have no reason to doubt that they think so, but I do impugn the accuracy of their observation, and the wisdom of their measures.

When the surface of the uterine canal has become covered with granulations or vegetations, the actual cautery and the strongest mineral acids may often be applied with impunity, and without injury to the deeper tissues, since they are thus protected; yet the practice, as we shall see hereafter, except for the treatment of malignant disease, is unnecessary, and to be avoided. .

We have no means of judging as to the full extent of disease within the uterine canal, or with accuracy, as to its locality, when situated beyond the range of our vision. The facility for locating its limit exclusively to the cervix, body, or fundus, rests only in the brain of the theorist, and has no existence in practice, and in any case, it will be but a question of time before the whole canal becomes equally involved. From our knowledge of the character of the lining membrane of the cervix, we are often warranted in inferring that the cervical portion, near the internal os, is involved when the secretion is profuse, clear, and gleety, and that, when it is less in quantity and consistence, the morbid process is located nearer the fundus. Experience also indicates that, when the discharge is profuse, and there is but little enlargement of the uterus, the disease is located chiefly in the cervix, and will probably readily yield to treatment; while, if the uterus is enlarged, and menstruation disturbed, no matter what may be the character of the discharge, the case will prove a more tedious one, since the whole organ is then involved.

Our remedies for internal use should, therefore, be of a character innocuous to healthy tissue, as we cannot limit their action to the diseased surface exclusively. Since we cannot direct our remedies with accuracy within the uterine canal, or watch their immediate effect by the aid of the eye, our practice is necessarily somewhat empirical. We will often fail in obtaining the same result from a remedy which had proved most efficacious in a previous case presenting similar features, so far as we possessed the means of discriminating. It may often happen, with all due care, that a diseased surface will remain covered and protected by its viscid secretion, so that an application will reach the more healthy portion of the canal alone. We have only a general rule to guide us in a selection of remedies, which is, that those of a more stimulating character, and astringents, are more useful for diseases confined chiefly to the neck of the uterus, while milder alteratives are best adapted for the upper portion of the canal.

The solid nitrate of silver acts with more promptness in healing an erosion, and in arresting a profuse secretion from the cervical canal than any other agent, with the exception of those which are to be classed as caustics proper. It is stimulating, and acts as a powerful astringent to the small bloodvessels within reach of its influence, so that less blood passes to the mucous follicles, and their secretion becomes sufficiently diminished for the erosion to heal. The immediate action, however, of the remedy is to increase the secretion of these glands and to give it a watery character, until the vessels have contracted.

The structure of the cervix is naturally more dense than that of the body of the uterus, and it has very few bloodvessels in comparison with the body, but it is covered, as is the vagina, by erectile tissue on which its mucous membrane is chiefly dependent for its vascularity. So long, therefore, as the mucous membrane of the cervix and its canal can properly perform its function, so long will the tissues remain soft, and the induration often detected in the neck will not be found unless its mucous follicles, or glands, have been destroyed or their number greatly lessened.

The continued use of the nitrate of silver is as certain to cause contraction of the os, and to bring about this destruction of the mucous glands as is the application of the cautery, and it has been productive of more harm than the latter, from a want of judgment in its common use. In my practice I cannot count more than half a dozen cases treated by this remedy in a year. It should be used only when the cervix and body of the uterus are both enlarged and soft, and the os patulous, and giving issue to a profuse cervical discharge. I am, then, disposed to use the agent only when the patient is very anæmic, and when it is absolutely necessary that some check should be placed on the discharge without delay. I seldom make more than a single application, and only when the tissues are unusually soft, as above described. I always apply it with great care, so as not to include the tissues immediately about the os, and I protect this surface by a suitable instrument if the caustic is passed into the canal.

For the cervix, and the canal below the internal os, I frequently use the impure carbolic acid, or creasote-tar, prepared by Dr. Squibb for commercial purposes. Its action is entirely different from that exerted by the pure carbolic acid, which is essentially a caustic when used undiluted. It is an alterative as well as an astringent, and often exerts a marked local anæsthetic effect. Learning from Dr. Squibb, some seven or eight years ago, that he had observed its anæsthetic effect when used as a dressing to burns, I first applied it to the uterine canal and to the female bladder. Since that time I have used it undiluted; diluted with glycerine, when I wished a milder action; or mixed in equal parts with Churchill's tincture of iodine, to increase its alterative effect. It coagulates thoroughly the albuminous discharges from the uterine canal, but to insure full efficiency, it is always advisable to make two applications, as the first may be partially neutralized. I have also used as local agents pyroligneous acid, and pure acetic acid, and occasionally creasote alone, or in combination with iodine. When a case proves more obstinate, equal parts of chromic acid and water will be found an efficient remedy, one not now used as much as formerly, since, with other means at command for more general treatment, milder local agents are found to answer in most cases. Water is the proper agent with which to dilute chromic acid, for with glycerine it forms an explosive mixture. As adjuvants, tannin and the pinus Canadensis, alone, or in combination with glycerine, and the balsam of Peru are valuable remedies. A serious objection will be made by the patients to the use of either of the last-named agents, as their linen will become stained by them, unless the greatest care is exercised. This accident can be avoided by the use of a napkin, which I require every patient to wear during the day on which she has received any local treatment. The pinus Canadensis, as furnished to the profession, when first introduced, was a much more efficient remedy than the article now found in the market. For some reason it is now too thin and watery, and I have been obliged to have it carefully reduced by evaporation in a sand bath to the consistency of tar, when it can be used in this condition or diluted with glycerine. Glycerine and iodine are in more common use than any other remedies, and are applicable in some form for all varieties of uterine disease. To Dr. Sims we are indebted for the use of glycerine in the treatment of these diseases, and it is an agent for which we have no substitute. As a solvent or vehicle for other agents it has a greater range of usefulness than any other substance, and as a disinfectant it is also valuable. When placed in the vagina, it provokes, in consequence of its avidity for moisture, a profuse watery discharge, which empties the capillaries without apparently taking more than the serum, or robbing the blood of other constituents, to the detriment of a patient's strength. In fact, an anæmic patient will gain strength from its constant presence in the vagina, although the discharge excited by it may be greater than the previously existing leucorrhœa, and the fact can only be explained on the supposition that the glycerine arrests the escape of the more essential constituents of the blood. The loss of albumen in the leucorrhœal discharge is a very serious one, and when constant, it becomes an important factor in bringing about a condition of anæmia. So if it be the case that the glycerine removes only the watery portions of the blood, and by some action arrests the escape of the albumen and the other component parts, its value as a dressing will be readily conceded. It has, also, the same power as of the woman improves rapidly, since, for the time, a great leak has been stopped, by which she was constantly pouring out her life-blood in the form of leucorrhœal discharge. But, as the primary cause is not removed, the erosion must return again and again, until at length, if the treatment be continued, every mucous follicle will have been destroyed, and no further discharge can take place; but the hypertrophy of the uterus and the abnormal condition of the pelvic circulation will remain. If the application be strong enough to produce a slough, then, of course, the mucous follicles will be destroyed; but even if milder means, as the use of the nitrate of silver, be persevered in long enough to heal the surface, the damage will be quite as great, since the tissues will have been rendered sufficiently dense to cause atrophy of these follicles, and, after either mode of treatment, the tissues become essentially cicatricial in character.

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It is by no means an unimportant point of detail that the applicator should be accurately curved to correspond with the uterine canal. It is, indeed, most essential, as frequently, unless this precaution be taken, profuse bleeding will occur in at least sufficient quantity to entirely neutralize the effect of the remedy applied. Even did no worse result follow the violent introduction of the applicator than suffering on the part of the patient, the greatest care should be exercised, and it will be found after some experience that where local applications are necessary within the womb, they can be made without producing the slightest disturbance.

If it be desirable (and it often is) the cotton may be left in the canal with a portion projecting from the os, as it will cause no disturbance and will be thrown out into the vagina within a few hours. To facilitate the slipping of the cotton from the applicator, it is only necessary, after twisting it on tight, to hold it between the fingers as the flat instrument is turned in the opposite direction. This leaves the cotton loose on the applicator, and, when passed to the fundus, it will generally remain behind as the instrument is withdrawn, but if not, the pressure of the index finger or of a pair of forceps against the cotton at the external os will be sufficient to disengage it. The advantage of this is twofold: we are able to make a more thorough and lasting application, of iodine for instance, by leaving the remedy longer in contact with the diseased surface, and, at the same time the uterus is stimulated to contraction by the presence of a foreign body within its cavity. This is a convenient method also for the introduction of the dry persulphate of iron, the oxide of zinc, alum, or any other powdered substance employed alternately with the iodine. Before the cotton has been loosened on the applicator, it should be dampened, so that when dipped into the powder, a sufficient quantity may adhere to it. When powdered substances are used, it is even tralized. I have also used as local agents pyroligneous acid, and pure acetic acid, and occasionally creasote alone, or in combination with iodine. When a case proves more obstinate, equal parts of chromic acid and water will be found an efficient remedy, one not now used as much as formerly, since, with other means at command for more general treatment, milder local agents are found to answer in most cases. Water is the proper agent with which to dilute chromic acid, for with glycerine it forms an explosive mixture. As adjuvants, tannin and the pinus Canadensis, alone, or in combination with glycerine, and the balsam of Peru are valuable remedies. A serious objection will be made by the patients to the use of either of the last-named agents, as their linen will become stained by them, unless the greatest care is exercised. This accident can be avoided by the use of a napkin, which I require every patient to wear during the day on which she has received any local treatment. The pinus Canadensis, as furnished to the profession, when first introduced, was a much more efficient remedy than the article now found in the market. For some reason it is now too thin and watery, and I have been obliged to have it carefully reduced by evaporation in a sand bath to the consistency of tar, when it can be used in this condition or diluted with glycerine. Glycerine and iodine are in more common use than any other remedies, and are applicable in some form for all varieties of uterine disease. To Dr. Sims we are indebted for the use of glycerine in the treatment of these diseases, and it is an agent for which we have no substitute. As a solvent or vehicle for other agents it has a greater range of usefulness than any other substance, and as a disinfectant it is also valuable. When placed in the vagina, it provokes, in consequence of its avidity for moisture, a profuse watery discharge, which empties the capillaries without apparently taking more than the serum, or robbing the blood of other constituents, to the detriment of a patient's strength. In fact, an anæmic patient will gain strength from its constant presence in the vagina, although the discharge excited by it may be greater than the previously existing leucorrhœa, and the fact can only be explained on the supposition that the glycerine arrests the escape of the more essential constituents of the blood. The loss of albumen in the leucorrhœal discharge is a very serious one, and when constant, it becomes an important factor in bringing about a condition of anæmia. So if it be the case that the glycerine removes only the watery portions of the blood, and by some action arrests the escape of the albumen and the other component parts, its value as a dressing will be readily conceded. It has, also, the same power as hot water, although in a less degree, of exciting capillary contraction, for any surface which has been long in contact with the glycerine will be found shrivelled and blanched in appearance.

After the examination of every patient I have been in the habit of leaving in the vagina a portion of cotton saturated with glycerine, to which a string is attached, that the patient may be able to remove it in a few hours when it begins to become dry and irritating. Cotton was recommended by Dr. Sims as the vehicle for applying glycerine in this manner, and has been in use for fifteen or eighteen years. Recently I have employed a better material in the form of oakum, which has been prepared for drainage in surgical wounds. I have for years sought a substitute for the cotton, as this substance, in a few hours, will become matted into a ball, although, on its introduction, it may have been spread out with care over the base of the bladder. If the patient should neglect to remove it, after it has gotten into this condition, its presence will often cause a great deal of irritation. A small portion of oakum should be carefully spread out and compressed firmly between the hands, so as to have it not thicker than a few sheets of paper, nor larger than some two and a half inches in length by a little less in width. For its removal, a short cord or thread can be tied across the middle, but not tight enough to prevent the pad from lying flat. By pouring the glycerine over the oakum, and compressing this with the fingers, it will take up more of the fluid than the same bulk of cotton is able to do. If it be then spread out on the anterior wall of the vagina, it will occupy less space than the cotton, and will remain perfectly flat until it is removed. When dry, the oakum feels harsh, and the least fitted substance for the purpose, but if saturated with glycerine it becomes as soft as the finest moistened sponge. For the purpose of drainage, this material is unequalled, while, from being saturated with tar, it is antiseptic, and will remain in the vagina, free from all odor, a much longer time than cotton.

The glycerine should always be of the best quality and purchased from a reliable dealer, for the impure article, used in the arts, is frequently substituted on account of its lower cost, and its use will frequently cause a vaginitis as severe as that produced by gonorrhœa.

Iodine has proved the most valuable of all remedies, and it is one which loses nothing of its efficacy by frequent use. It is not only a local stimulant, by which congestion is relieved, but is likewise a reliable alterative and an efficient excitor of uterine contraction. It acts promptly in causing contraction of all the bloodvessels within range of its influence, and its stimulating effect on the absorbents is well known. Of all remedies applied within the uterine canal, iodine will be taken up into the general circulation the soonest, and it can be detected by the taste in an incredily short space of time; it therefore acts not only locally but also as a general alterative on nutrition. It is to be applied not merely to the uterine canal but frequently to the whole vaginal surface, and particularly over any region where tenderness can be detected by pressure made with the finger. When applied freely to a surface exposed to the air, iodine will frequently blister, and cause great pain; therefore, some care must be exercised, that it does not come in contact with the outer portion of the vagina. If, by accident, this occurs, the surface can be smeared with glycerine, which will promptly relieve the burning sensation caused by it. The officinal tincture of iodine was long in use for the treatment of uterine disease, but the benefits resulting had been by no means satisfactory or reliable, until the preparation known as Churchill's iodine was employed. To the late Dr. Churchill, of Dublin, we are indebted for this preparation, which should be a saturated tincture. The proportions, however, have been somewhat changed from the first formula to prevent a deposit which took place as the alcohol evaporated. The one now in general use consists of seventy-five grains of iodine, ninety of the iodide of potassium, to an ounce of alcohol.

Unless the uterus has been previously dilated it will be necessary to use the applicator (see page 30), for the introduction of fluid substances within its canal. A small portion of long-fibre cotton is to be carefully drawn out with the fingers into a triangular form, as thin as possible, and about three inches in length. From one corner of the triangle the cotton should be twisted tight around the applicator, by rolling it in the firm grasp of the fingers. It is then necessary to obtain, by means of the uterine probe, the exact curve and direction of the canal, and this can best be done by placing the patient on the left side, with the cervix brought fully into view. After bending the applicator accurately to the curve indicated by the probe, the cotton is to be dipped into the fluid to be applied, and as the cervix is steadied by a tenaculum held in the other hand, the instrument can be passed to the fundus, the patient being in the same position. The probe should never be introduced into the uterine canal with less care than a surgeon would exercise in exploring the tract of a wound. If the importance of this were more generally appreciated, cellulitis would be a rare occurrence after its use. If a digital examination be first made while the patient lies on the back, the use of the probe becomes valuable to verify the impression conveyed by the finger, as to the position of the uterus. It should then be bent to correspond with the supposed curve of the canal, or direction of the uterus, and introduced with sufficient care to enable the examiner to fully appreciate any deviation. As soon as this is detected or if any obstacle to its passage is felt, the instrument should not be forced, but withdrawn, and the curve altered until it can be passed to the fundus without difficulty. When the probe is manipulated with proper care and patience, we will rarely find any obstruction in the uterine canal which cannot be readily overcome after the true direction of the canal has been ascertained.

It is by no means an unimportant point of detail that the applicator should be accurately curved to correspond with the uterine canal. It is, indeed, most essential, as frequently, unless this precaution be taken, profuse bleeding will occur in at least sufficient quantity to entirely neutralize the effect of the remedy applied. Even did no worse result follow the violent introduction of the applicator than suffering on the part of the patient, the greatest care should be exercised, and it will be found after some experience that where local applications are necessary within the womb, they can be made without producing the slightest disturbance.

If it be desirable (and it often is) the cotton may be left in the canal with a portion projecting from the os, as it will cause no disturbance and will be thrown out into the vagina within a few hours. To facilitate the slipping of the cotton from the applicator, it is only necessary, after twisting it on tight, to hold it between the fingers as the flat instrument is turned in the opposite direction. This leaves the cotton loose on the applicator, and, when passed to the fundus, it will generally remain behind as the instrument is withdrawn, but if not, the pressure of the index finger or of a pair of forceps against the cotton at the external os will be sufficient to disengage it. The advantage of this is twofold: we are able to make a more thorough and lasting application, of iodine for instance, by leaving the remedy longer in contact with the diseased surface, and, at the same time the uterus is stimulated to contraction by the presence of a foreign body within its cavity. This is a convenient method also for the introduction of the dry persulphate of iron, the oxide of zinc, alum, or any other powdered substance employed alternately with the iodine. Before the cotton has been loosened on the applicator, it should be dampened, so that when dipped into the powder, a sufficient quantity may adhere to it. When powdered substances are used, it is even more important, for efficacy in the application, to leave the cotton within the canal, than it is when fluids are employed.

As with gleet in the male, so here the pressure or presence of a foreign body in the canal is often of great benefit; it not only lessens the discharge, but also excites contraction in the organ, and gives more tone to the vessels.

I have found to answer well for this purpose tents made from the pith of a large cornstalk, as recommended by Dr. Goldsmith of Ga., for dilating the canal. The doctor kindly sent me a number of these tents made by himself, but I was disappointed in their limited dilating power. I found afterwards that, as he had only employed the strength of his fingers to compress the pith into tents, the full force of the material was not secured by this mode of preparing it. After the pith had been soaked for several hours in what was boiling water at the beginning, I had the tents prepared after the same method already described for making them of sponge, with the exception that no mucilage was required, in consequence of the different character of the two substances. But they were, in the same manner, compressed on a steel staff by being wrapped as tightly as possible with a cord, then removed, bent to different curves, and left to dry before the cord was taken off. While these tents are, by comparison with compressed sponge, of inferior value for dilating the uterine canal, yet they answer well enough when only a moderate degree of pressure is required for producing an alterative effect on the lining membrane. The surface being smooth and free from irregular interstices, the lining membrane does not become abraded from their use as from sponge tents; they entail, therefore, but little risk of blood poisoning. As the pith softens slowly, and, for a time is as hard and unyielding as a sponge tent, it is always prudent for the patient to remain quiet for several hours after its introduction. For the same reason it is more difficult to retain a pith tent in the canal, and it is, therefore, necessary to place a compress of oakum or cotton, saturated with glycerine, against the cervix. I have found that dipping a tent of this material into iodine, and then introducing it within the canal, is a very thorough method of applying that agent.

In hospital practice, when I could control the movements of the patient, I have long employed sponge tents to bring about a reduction in the size of an enlarged uterus. This mode of practice was original with me,[1] and from long experience I have found it most satisfactory when employed under proper circumstances. The object is to bring about by pressure an alterative effect in the mucous membrane and indurated tissue, to excite contraction of the whole organ, and to lessen the circulation in the uterus by means of the profuse watery discharge which it invoked.

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[1] See Uterine Surgery, by Dr. J. M. Sims, p. 65.

I cause the bowels to be moved with medicine, or by enema, on the morning of a clear bright day, and, if the strength of the patient will admit of it, I direct that she shall remain in the open air for several hours before being seen by me, as she must be confined to the house afterwards for at least two days. A bright, clear day, with the wind from any quarter except from the east, I always select for dilating the uterus, or for performing any serious surgical operation. My reasons for doing so are, in the first place, that under such circumstances I am myself in better condition, but chiefly because the nervous system of a patient is in better tone, and the powers of endurance greater on a clear day. Moreover, experience has taught me that in a state of the atmosphere favorable to an active condition of the skin, there will always be less danger from blood poisoning. I have also been impressed with the conviction that the occurrence of cellulitis is a far more frequent sequel to the use of the sponge tent, when employed during the prevalence of damp, cold, and easterly weather, even when the patient is confined to the house and protected from all exposure.

As I strictly observe the predilection in favor of clear weather and of the rules which I have already detailed when considering the use of sponge tents, my practice for years has been almost entirely free from any bad consequences attending their use. If the canal is not straight, I carefully select a tent of the proper curve, and as large a one as can be introduced without using violence. The patient is then placed in bed, as I have described, and a hot water vaginal injection is given, night and morning, and an opiate, if needed. At first, even should there have been no pain, I remove the tent at the end of twenty-four hours, but, after several have been employed, I allow it to remain for thirty-six or forty-eight hours, that the patient may obtain the benefit of the profuse watery discharge which it excites. After removing the tent, I place the patient on her back over a bed-pan, and alongside of my finger I pass the nozzle of a Davidson's syringe to the fundus, and inject a stream of hot water into the cavity, until the organ has contracted on my finger. I then place the patient on the side, introduce the speculum, seize the cervix with a tenaculum, and pack some cotton about it, to receive the excess of iodine, which is to be introduced into the canal. The iodine may be either injected by pressing the nozzle of the syringe to the fundus, or applied by means of the applicator, leaving the saturated cotton within the canal; but it will be necessary to use a larger mass of cotton than would be employed were the canal not dilated.

In all cases it is essential that the patient remain in bed for twenty-four hours after dilating the uterus, and applying the iodine by this method. If the application should be followed by an increase of backache, or any other disturbance, the patient should remain in bed for a longer time, and prudence would dictate the necessity of avoiding all over-exertion during the few days following.

On account of the confinement, and in order that the patient's health may not suffer from it, it is seldom advisable to make use of tents oftener than twice during a month, and an interval at least of ten days should elapse between the last dilatation and the appearance of the catamenia.

Early in 1863 I injected Churchill's iodine into the dilated uterine canal, with the view of exciting still more the uterine contraction after the use of sponge tents. I had observed this effect during the previous year that I had been using the remedy, prepared according to the formula now in general use, but which was then procured by Dr. Sims for me from Dr. Churchill. Towards the close of the year, or early in 1864, I injected, at the Woman's Hospital, the dilated uterus of a young woman who had suffered from malarial congestive hypertrophy, when the organ contrated so suddenly, and with such force, as to expel a portion of the iodine from the uterine cavity, entirely out of the vagina, as from a squirt. In this case I was assisted by Dr. John G. Perry, then house surgeon. His predecessor, Dr. G. S. Winston, had also observed with me this effect in the treatment of other cases, but in a less marked degree.[1] No one, previous to myself, had followed this plan of treating hypertrophy of the uterus, nor had any one to my knowledge recognized iodine as an agent for exciting prompt uterine contraction.

The passage of a continuous stream of hot water into the uterine cavity, after thorough dilatation of the canal with the view of causing rapid contraction, and, at the same time, bringing about a modified action in the lining substance itself, is a practice I believe to be also original with me.

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[1] Until the publication of Dr. Sims's work on Uterine Surgery, in 1866, I was not aware that any one but myself, unless through my advice, had ever injected the uterus with iodine to arrest hemorrhage. Dr. Sims describes, in his work, this plan as then being the mode of treatment employed by Dr. Savage in the Samaritan Hospital, London.

If the condition of the patient be one justifying the use of sponge tents, and if she be properly situated for receiving this treatment, the effect of hot water will prove most satisfactory in its results. The action of hot water on the interior of the uterine canal, when applied directly, is even more beneficial than is its indirect action from the vagina. In connection with the modifying effect of the pressure of the tent, and the free application of iodine afterwards, I have found hot water to exercise a more decided action in checking excessive secretion from the mucous glands, than can be gained by the introduction of any remedy into the undilated canal, unless the agent be such as will sear over the interior, when, of course, all secretion will cease. The good effects of this mode of treatment are not confined to cases of enlargement of the uterus. It is equally beneficial, if not more so, where there exists no enlargement, since the disease is then confined chiefly to the cervix, or at least to that portion of the canal below the internal os. By dilating the canal thoroughly, in these cases, we will open out the rugæ, so that the agent applied can be brought directly in contact with the mouth of each crypt and every portion of the mucous membrane. This cannot be done under ordinary circumstances, and the fact will explain the negative result, frequently observed after applications made through an undilated os, for the nearer the uterus approaches to a natural size, the deeper will these folds be found.

The undilated uterus should never be injected, since the mildest and most unirritating substances thrown into the uterine canal, when in this condition, will often cause a profound degree of collapse, frequently cellulitis, and almost always pain. It has been supposed that the difficulty arises from a part of the fluid passing through the Fallopian tubes, and so coming in contact with the peritoneum. But this explanation is based entirely upon theoretical grounds, for we know by experience that the peritoneum is not so immediately responsive to contact with other substances; although it is true an attack of peritonitis would be likely to follow such an accident. That it is not necessary for any portion of the fluid to escape through the Fallopian tubes in order to produce the most serious consequences is proven by the sudden death, which occurred a short time since in one of the Western cities, of a woman, in good general health, who exhibited no special symptoms beyond a slight convulsive movement, after a small quantity of Churchill's iodine had been injected into the undilated uterine canal. In this case, as I have been informed, the post-mortem examination revealed the important fact that no portion of the iodine had passed into the Fallopian tubes, nor into the uterine sinuses, and we must, therefore, seek an explanation of the death in some effect produced on the nerve centres, by which reaction from the sudden shock was prevented. In our ignorance, we must rest satisfied with the practical fact which has been fully established, that when the canal is sufficiently dilated for the free escape of fluids, it may be injected, nбt only with impunity, but even with benefit. Of all the various devices which have been conceived for injecting the uterine canal, not one can be used with absolute safety when it is not dilated.

My old friend, the late Dr. J. C. Nott, was very expert in injecting the uterus, and devised the best canula in use for the purpose. Some years ago, when the Woman's Hospital was under my charge, Dr. Nott was on duty as an assistant surgeon, and was very anxious to demonstrate the advantages of this mode of treatment. His service consisted of twenty beds, and in one week after going on duty, about fifteen of his patients were down with cellulitis; fortunately none of them died, but several were very ill, and remained in the hospital afterwards for two years or more before they were relieved of the consequences. The doctor had been particularly fortunate in private practice, but this experience led him to abandon the mode of treatment.

Blistering the cervix occasionally will be found a useful adjuvant to other treatment. It is of value when the whole uterus is enlarged, and particularly when the cervix has been indurated. The blister causes a very free watery discharge which relieves the congestion, and at the same time stimulates the organ to contraction. When the cervix has become indurated, the blister is beneficial for its revulsive effect, but it will be of little service should the mucous membrane of the cervix have been destroyed by the long-continued use of nitrate of silver or other caustics. Under these circumstances, we will be obliged to resort to a surgical procedure, to be described hereafter.

Some ten years ago, I was in the habit of using vesicating collodion, but abandoned it in consequence of being unable to confine the action of the blister to the cervix. As the cantharides was held in solution by so volatile a substance as the ether, the whole vagina would often become blistered. Shortly afterwards, I found on the market a solution of cantharides in acetic acid, which has answered fully every purpose, since its action can be confined to the most limited space, when so desired.

I have the patient previously prepared by a movement of the bowels, that there may be no necessity to get up for a day or two. In applying the blister, the patient is placed on the left side, and the cervix brought into view by the aid of Sims's speculum. I am in the habit of drawing the cervix a little forward with a tenaculum, and then, with a pair of forceps, packing a small portion of cotton around the cervix, but chiefly below, that the fluid may be prevented from running on the vaginal surface. The blistering fluid may then be applied with a camel's-hair pencil, or by means of a little cotton twisted around the end of the swab-stick. When a thorough action is required, the blistering fluid can be rubbed over the same surface until it has become of a gray color. It must be allowed a moment or two to dry, when the surface will be found to have become shrivelled, and, for a time, the whole neck will remain reduced in size. The patient is to be kept quiet in bed, the vaginal injections being omitted for three or four days, until the discharge becomes copious. It is seldom that there will be any backache or discharge under twenty-four hours, and, if the patient keeps the horizontal position, the former may be avoided. After the fifth day the parts will heal rapidly under the use of injections, night and morning, of warm (not hot) water to which a little Castile soap has been added. After the morning injection a pledget of oakum, saturated with glycerine, should be laid over the raw surface daily, and removed by a string attached to it, whenever it begins to be uncomfortable. When the whole cervix has been blistered, it is necessary that the patient should remain in bed from four to six days, and, until the discharge ceases, she should not expose herself to the risk of taking cold nor to the dangers of over-exertion.

After this agent has been applied, in the manner described, the epithelium alone is removed from the mucous membrane, and the whole surface is generally healed in seven or eight days, although it may remain, for a few days longer, of a deeper color than natural. When applying the fluid, a little cotton may be inserted within the os, to prevent its entrance into the canal; it is especially necessary to do so when the os is much smaller than natural. I have carefully watched the after-effects of this remedy, and I have never seen any evidence of narrowing of the os produced by its use. But it will sometimes cause great pain, and much backache afterwards, if the fluid be allowed to run into a canal with a constricted os. When the discharge is free, and the os well open, I have sometimes intentionally applied the fluid to the lining membrane of the canal to bring about an alterative effect in the mucous glands, sometimes, as I have thought, with a result decidedly beneficial, but its use, in this manner, is always attended with more pain than when applied to the cervix alone.

There are certain practical points which should never be lost sight of in connection with the local treatment, to which I shall again call attention. We should have the fear of cellulitis always before us, in the treatment of these diseases, and as common as this complication is from cold and other causes, it has its origin quite as frequently in carelessness on the part of the practitioner.

We should never introduce the probe, a sponge tent, or make an application within the uterine cavity, if the slightest indication of cellulitis can be detected. Nor should we attempt to correct a displacement of the uterus, if cellulitis exists, or as long as any tenderness, attributable to inflammatory origin, can be detected on pressure by means of the finger. But we must discriminate between a condition of hyperæsthesia, to be found in anæmic and hysterical women, and one of inflammation, since an error of diagnosis, although ordinarily resulting merely in a loss of time, may not rarely result in a loss of the patient. It is, therefore, better in all cases of doubt to give the patient the benefit of some preparatory treatment.

After an application to the uterine cavity, rest, for a time, in the horizontal position is always advisable, and this precaution is particularly to be observed when an application is made for the first time. It is equally prudent to observe the same precaution after replacing the uterus for the first time; and, when there has been much pain produced, or difficulty experienced in the reduction, I generally insist upon the patient remaining in bed until all danger has passed. In my private hospital the rule is for every patient to lie down after any application to the uterine canal, to have some covering thrown over the lower part of the body, and heat applied to the feet if these should be cold. In my office practice, I often retain outside patients for hours as a matter of prudence, and, when advisable to do so, I keep them until next day or longer. When an operation has been performed or an application has been made to the uterus, of sufficient severity to make it prudent that the patient should remain in bed, she is not allowed to assume the upright position, but is lifted into bed after the sheets have been warmed, and a vessel of hot water placed for her feet. As long as we are able to keep the feet warm, the danger of cellulitis will be slight. A patient is never to be allowed to put her feet out of bed as long as it is necessary that she should remain there. If she should be unable to empty the bladder on a bed pan, the catheter must be resorted to. To this imprudent act of getting out of bed, so commonly committed by women, without thought of the consequence, may be traced many an attack of cellulitis, it being brought on by the sudden, although momentary (it may be) exposure of the feet to cold. It has caused more diseases in women who were previously healthy, than could result from any other single act of imprudence, within their power to commit; and, to my knowledge, several deaths have occurred from pelvic abscesses which were due to a disregard of the precautions enjoined. However trivial or unnecessary these details may seem to be, their importance is not exaggerated, for experience has taught me that in the observance of every precaution lies the secret of immunity from complications and success in treating uterine disease.

Before closing this portion of our subject, let us recapitulate briefly the principles which should govern us in the use of local means for the treatment of these diseases. Our *first aim should be to give tone to the pelvic vessels, and to place the uterus in a position where the circulation will be the least obstructed.* The first is to be accomplished by the frequent use of hot water injections, given in a favorable position, which will cause the vessels to contract after they have been somewhat relieved of their over-fulness by the action of gravity. The second is to be gained by a pessary properly constructed to suit the individual peculiarities of the case. Pessaries, however, should never be employed while cellulitis exists, or when the position or condition of the uterus indicates the necessity for preparatory treatment, since there is a proper time and mode of applying pessaries to advantage, quite as much as there is for splints in the treatment of a fracture. All our other local remedies are to be employed as aids in carrying out this purpose; the increase in size of the vessels is to be reduced; augmented secretion is to be diminished by improving the nutrition, and by restoring the equilibrium of the circulation. We must carefully discriminate between cause and effect, and bear in mind that, as a rule, the local condition is but an expression of the state of the whole body, and is not likely to be permanently benefited, unless we can at the same time improve the general nutrition, by a careful and well regulated constitutional treatment.

The female organs of generation have been especially endowed with a degree of tolerance to injury not possessed by the male; and woman in being thus favored is the better able to bear the perils of gestation. But few, however, of the many physician who undertake to treat these diseases fully realize that there is a natural limit to this tolerance. No portion of the body has suffered more from the overzealous interference of ignorant practitioners, and from the carelessness of those who, though not ignorant, fail to make such a thorough investigation of their cases as is essential to their successful management. Under the guise of surgery, the uterus has been subjected to a degree of mal-practice, which would not be tolerated in any other portion of the body. Its cavity has been, and is to this day made the receptacle for agents so destructive, that it seems difficult to understand how their evil effects have escaped observation. But I trust we have already passed the heroic age, and that in the treatment of uterine diseases, we may be hereafter governed by the same rational methods as should apply in every branch of medicine, that is, we may simply, as we term it in this country, exercise our "common sense."

CHAPTER IX.

OVULATION AND MENSTRUATION.

Nerve supply of the ovaries—Puberty—The uterus not the dominant organ of the female—Menstruation not always due to ovulation—Disintegration of the lining membrane of the uterus during menstruation—Causes which determine early or late menstruation—Table I., showing age at first menstruation, for single, sterile, and fruitful women; and whether menstruation was regular or not—Table II., showing the percentage on the whole number menstruating at a given age—Table III., showing the percentage in relation to regularity or irregularity—Table IV., regularity further analyzed—Table V., pain during menstruation in reference to health, disease, and sterility—Table VI., showing proportion suffering pain with menstruation for each menstrual age—Table VII., showing further relation of pain to menstruation—Table VIII., pain during menstruation for all conditions—Table IX., showing average duration of the flow—Table X., showing duration of flow with reference to circumstances of first menstruation—Table XI., changes in duration of flow in after-life—Table XII., menstrual changes as to quantity and duration.

THE ovaries are supplied with nerves from the solar plexus, a part of the great ganglionic, or sympathetic system, which presides over the nutritive functions of the entire body.

At a certain age, a stimulus is given to the nutritive functions by the new influence emitted from the ovaries, and causes a rapid physical growth of the female. The transition from girlhood to womanhood takes place as the ovaries attain their full development, and this period is termed puberty. This climax is, under normal circumstances, expressed by a discharge of blood from the uterine canal. This discharge of blood is called the menstrual flow, and it returns at regular intervals, until a certain period of middle life, when it finally ceases and the ovaries become atrophied and no longer play an important role in the body.

During the menstrual life, the ovarian influence is, in health, the dominant power. Through the medium of the sympathetic system of nerves it exercises as important a part in the organization as the fly-wheel, or governor, does in regulating the power and speed of a well-constructed engine.

The ovaries are the egg-bearing organs of the female. The eggs, germs, or ova, exist in large numbers in each ovary, being contained in ovisacs called the Graafian follicles. As maturation progresses, the ovisac, or follicle, becomes more vascular, and enlarges by the accumulation of a serous fluid within its cavity. In this way it approaches and finally projects upon the surface of the ovary. At the proper time, it ruptures, when the ovum escapes and is seized by the fimbriated extremity of the oviduct, or Fallopian tube, and carried along this canal into the uterine cavity. Under favoring circumstances, it may become impregnated in any part of its course, even in the ovary itself.

It was formerly believed that the uterus exercised at all times, during menstrual life, the greater influence in the female economy, but it is now known that this and the other organs of generation are, under ordinary circumstances, but appendages, as it were, to the ovaries. During pregnancy, however, the force of the uterus becomes paramount, and that of the ovaries rests, for the time, quiescent. It is a fact well known that the ovaries are not unfrequently found fully developed when the uterus and vagina are wanting, but that the uterus never reaches its full size if the growth of the ovaries is deficient. Again, if from any cause, in after life, atrophy of both ovaries should take place, by which their function becomes impaired, the uterus also decreases in size and in importance.

The view is still held by many that the menstrual flow is always due to ovulation, but recent observations indicate that this is not correct. The subject is involved in much obscurity, owing to the difficulty of making the necessary observation upon the human female, and if ever settled it will probably be by the study of ovulation as observed in other animals nearly allied to the human species.

One point is settled beyond question, that the first menstrual flow is dependent on the final and complete development of the ovary. In other words, menstrual life never begins until the ovaries have been developed, so far as the vital forces of the individual will admit, to a full physiological standard.

There exists, frequently, a coincidence between ovulation and the occurrence of the menstrual flow. But it is claimed that this flow frequently takes place without the rupture of a Graafian vesicle, while ova are developed in the earliest infancy, during lactation, and even in after-life, when the menstrual flow has ceased. Instances are not rare where conception has taken place before the menstrual flow has ever appeared, and consecutive pregnancies are known to have occurred in the absence of the catamenia. I have, myself, met with one instance in which the woman had borne two children before her first menstrual period, at eighteen years of age. I have had also, under my care, three cases in which conception occurred during the prolonged absence of the menstrual flow, after a previous pregnancy; of these, one miscarried, and two went to full term. It has even been noted that ovulation occurs sometimes during the existence of pregnancy.

The *St. Louis Clinical Record*, May, 1879, contains the following case, reported in the *Vratschenya Vedomosti*, by Dr. Rodsówich, a Russian physician: "A peasant's widow of the province of Nijni-Novgorod, menstruated for the first time at the age of thirty-six years. She had her first sexual relation in her fifteenth year, before menstruating. Since that time, and during her entire married life, she was constantly pregnant or nursing, without any menstrual flow. Her husband died when she was thirty-six years old, since which time her monthly flow has returned with great regularity. She had twins at her second, fourth, and eighth confinements, so she had sixteen children."

Dr. Wm. B. Hazard, the editor of the *Clinical Record*, adds, in connection with the above case, the fact of a patient under his own observation, who had five children within ten years, and had never menstruated during that time.

We are ignorant of the length of time necessary for the ovum to reach the uterus after it has once entered the Fallopian tube. But the ovum either possesses a remarkable degree of vitality, or it does not reach the cavity of the uterus before the flow takes place. For it is a fact well attested that conception may occur at any time during the interval between the flow, although, as a rule, it takes place shortly after menstruation has ceased. The inference is a fair one, that impregnation is frequently effected before menstruation begins, or that the ovum does not enter the uterine cavity until the flow has ceased. We cannot otherwise explain the fruitfulness so common among the Hebrews. I have been informed by some of my patients of this faith that a woman is considered unclean for five days before the period, and for a week after the flow has ceased, and that the law is religiously observed in non-intercourse with their husbands during this interval. I am without the necessary data to prove the assertion, but am under the impression that the average duration of the menstrual flow is rather longer for women of this race than for those of our own people. I had been informed of the general observance of the law, and a knowledge of it led me to make some inquiry in the case of a lady whose flow had always lasted a week, and who was the mother of a large number of children. She came under my care for excessive menstruation, which was then prolonged to ten days. She assured me that she scrupulously observed the law of her people, and yet she became pregnant twice, to my knowledge, during the six days only which remained in the month. She became pregnant, therefore, between the seventeenth and twenty-third days, after the beginning of one period, or between the eleventh and fifth day, before the next one began.

The connection between occurrence of ovulation and the menstrual flow has recently been investigated by Slaviansky and others. As the result of their observations, it is shown that the two processes are distinct after puberty. A further consideration of this subject is not within the purview of this work, but the study of certain changes in the interior of the uterine canal, which, it is held, take place during the menstrual flow, is of the greatest practical importance.

The late Dr. Tyler Smith was, I believe, the first to call attention to the disintegration, or throwing off, of the "mucous membrane" from the canal at the time of menstruation. His observations were limited; but in one instance, where the female had died during the flow, he was aided in the examination by Mr. Handfield Jones, and not a trace of the epithelium or of the utricular glands could be detected by aid of the microscope. That a disintegration does take place has been confirmed by the more recent observations of Drs. Farre, Williams, and Aveling, of England. Dr. Barnsfather, of Cincinnati, has also presented the result of his investigations into the microscopic appearances of the menstrual blood. He states that in every instance under observation, exfoliation of the "mucous membrane" took place, even from those in health. Dr. Engelman,[1] of St. Louis, on the contrary, claims that the "mucous membrane" becomes only thickened with the menstrual congestion, and regains its natural condition when the flow ceases.

Dr. Williams[2] regards the menstrual flow as a process not complete in itself, but only the last stage in a cycle which begins at the cessation of one menstrual epoch, and, passing through the "developmental changes" of the lining membrane of the uterus, ends with the close of the following period. That there is no interval of uterine rest, but that the nearest approach to this condition is during the bleeding, when the "mucous membrane" is undergoing fatty degeneration and disintegration. Even while the membrane is yet being thrown off, the subjacent muscular wall is in a state of active preparation for the formation of a new "mucous membrane," so that there is, strictly speaking, no such thing as a period of uterine inactivity. The lining membrane of the uterine cavity is generally thrown off cell by cell, the process beginning always just within the internal os, gradually extending to the fundus, and at the same time into the muscular wall. This process is completed, with many, in three or four days, but with some, seven or eight days are necessary before the whole membrane is removed. The disintegration not only affects the tissues about the bloodvessels, but the coats of the vessels also, so that these are opened, and hemorrhage takes place from them. This, he states, is Aveling's "denidation." It is also claimed that while this destructive process is going on, active proliferation is taking place in the muscular tissue beneath the membrane as it is thrown off. That the formation of the new membrane also begins immediately within the internal os, advances towards the fundus, and is completed at the end of a week. It is affirmed that this membrane is formed from the wall of the uterus, there being no cellular or submucous tissue, its "muscular fibres producing the fusiform cells, the connective tissue the round cells, and the groups of round cells, in the meshes formed by the muscular bundles, the granular epithelium." The whole membrane is found lined by columnar epithelium at the end of a week, by extension, it is supposed, from the epithelial lining of the cervix; and, probably, the epithelium of the tubular glands of the uterine walls contributes also to its formation. "An abrupt distinction between the mucous membrane and the muscular wall appears first near the cervix, about the tenth day after the cessation of the catamenial flow, and it gradually extends towards the fundus, which is reached a little before the bleeding time. At this time, the membrane has reached the highest degree of development attainable by it in the unimpregnated uterus, and is in a fit condition to receive the impregnated ovum." This stage he designates as Aveling's "nidation." He claims that "menstruation, then, is neither congestion nor a species of erection, but a molecular disintegration of the mucous membrane of the body of the uterus, followed by hemorrhage." The increased flow of blood to the uterus "is determined, then, by the active processes going on in the organ, and is in no way allied to congestion." The maximum is reached just before the menstrual flow appears. "When fatty degeneration sets in, the flow is suddenly reduced; when proliferation sets in actively again, the blood supply is increased, and continues gradually to be increased until the membrane has attained its full development, when the supply is again suddenly diminished, and the changes described take place, unless conception shall have occured."

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[1] American Journal of Obstetrics, May, 1875.

[2] On the Structure of the Mucous Membrane of the Uterus, and its Periodical Changes. By John Williams, M.D., etc. Obstetrical Journal of Great Britain and Ireland, March, 1875.

Dr. Aveling[1] defines "Nidation" to be the periodical formation of the membrane lining the body of the uterus, which is developed during the inter-menstrual period. He states that "without an ovary, there can be no reproductive life, and without this life there can be no nidation. So far, therefore, nidation is dependent upon ovulation for its being. Sexual life, however, once established, the existence and periodicity of nidation proceeds with an independence and individuality, the actuality of which is little appreciated." "Nidation has been likened to gestation. Denidation may be compared with parturition. The nidal decidua having reached its full development, and no impregnated ovum having arrived to demand from it protection and sustenance, a process of degeneration takes place, its attachments are loosened, and it is expelled by the contractions of the uterus, sometimes wholly in the shape of a triangular sac, but more frequently in minute portions. How long this process occupies, has not been determined, but it is probably completed during the menstrual period." "The act of denidation probably determines that of menstruation, because it is from the denuded surface of the uterus, caused by the removal of the nidal decidua, that the menstrual flow comes." "The process of denidation is doubtless very much assisted by that of menstruation. By the menstrual flow, the débris of the nidal decidua is floated and washed out of the uterus and vagina, and in this way the denidal act is rendered more prompt and effective."

Dr. Engelmann, in his paper already referred to, differs in opinion, and claims the deductions drawn by Dr. Williams are not always correct, since his observations were confined to the examination of the uteri of those who had died from diseases which may possibly have affected the condition of the uterus. Dr. Williams, in a subsequent article,[2] states, "The theoretical objections to the view that the so-called mucous membrane of the uterus is renewed by proliferation of the superficial laminæ of the muscular wall, is based on the fallacy of regarding that wall as a muscle pure and simple. I have pointed out in this paper that it is much more, that it is indeed part of the mucous membrane itself, and that the terms muscular wall and mucous membrane, as they are generally applied to the uterus, are misnomers." He also contends that the objections of Dr. Engelmann are not well taken, since his observations were not made in any case where the female had died during the menstrual period.

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[1] On Nidation in the Human Female, by J. H. Aveling, M.D., etc., Obstetrical Journal of Great Britain and Ireland, July, 1874.

[2] The Mucous Membrane of the Body of the Uterus, Obstetrical Journal of Great Britain and Ireland, Nov. 1875.

This subject is yet far from being settled, but its importance merits the fullest consideration. These investigations lead in the right direction, and by further observation are destined to throw light on many obscure points in the pathology and treatment of uterine disease.

Dr. Tilt[1] has tabulated the results of observation made in different parts of the world, to show the age of first menstruation for some 12,521 women. At Calcutta the average is shown to be 12.49; for Copenhagen, 16.88; and for 5218 English women, given in this table, from different observers, the average was 14.92 years. It is stated by the same author, on the authority of Dr. McDiarmid, who accompanied the Arctic Expedition under Ross, that puberty with the Esquimaux is frequently delayed until the age of 23, and with many afterwards only a slight show occurs during the short summer. The weight of evidence set forth in this table is conclusive in showing the influence of climate in hastening or retarding puberty. But my own impression is that the habits of race, through which the nervous system is influenced, are the most important factors in determining the time of puberty, and that climate, in itself, has but little influence. Privation, and a want of physical growth, as a rule retard the first appearance of menstruation, while an undue development of the nervous element always hastens puberty. Civilization, in connection with a luxurious mode of living, undoubtedly hastens this period, and it will be found that the women of the cities menstruate somewhat earlier than those living in the country with more simple habits of life.

More than half of the women who have been under my observation menstruated for the first time during the season of four months, between the beginning of April and the end of July. The explanation offered is that the organs of generation are in a more active state at this period of the year than at any other.

In Table I. I have given the age at first menstruation for two thousand three hundred and thirty women treated by me in private practice. They were from the better classes, nearly all natives of the country, and from every portion of the United States. With the advantage of so intelligent a class, I have been able to obtain accurate information on a variety of points which will be presented in a statistical form. I have unfortunately not obtained the same information from all, so that the number of cases will vary somewhat in the different tables. This has been due to inadvertence in recording the cases, or from the patient being unable to give the required information with accuracy, and where any doubt has existed the case has been excluded. When a patient has menstruated for the first time before or after the half year, I have placed the age for puberty at the nearest complete year, and to test the accuracy of this plan, I have added together with the even year the additional odd months for several hundred cases. For so large a number the result has been practically the same, and as but a slight difference was found between the average obtained by either method, the plan followed was adopted as a saving of labor.

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[1] On Uterine and Ovarian Inflammation, etc., by Edward J. Tilt, M.D., p. 41.

TABLE I.—*Regularity of Menstruation.*

Age at first menstruation	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	23.	Total number.	Average age of menstruation.	Average for each condition.
Unmarried—																
Regular from the first	1	7	21	55	85	43	35	11	2	2	..	..	..	262	14.16	
" afterwards	..	6	8	16	18	11	9	7	5	1	.	..	..	81	14.31	
" never......	2	1	12	9	14	8	7	8	3	2	..	..	..	66	14.36	
Total............	3	14	41	80	117	62	51	26	10	5	..	..	..	409	....	14.21
Sterile—																
Regular from the first	3	11	46	101	109	68	50	33	5	6	..	..	..	432	14.18	
" afterwards	2	7	20	30	26	21	22	8	4	4	..	..	..	144	14.18	
" never......	..	1	6	13	15	15	8	5	5	..	..	..	1	69	14.68	
Total............	5	19	72	144	150	104	80	46	14	10	..	..	1	645	....	14.23
Fruitful—																
Regular from the first	8	33	124	161	235	174	121	70	24	3	2	1	.	976	14.22	
" afterwards	3	11	32	42	49	40	23	21	11	2	1	.	..	235	14.24	
" never......	..	4	5	10	20	6	13	5	2	..	..	..	..	65	14.35	
Total............	11	48	161	213	324	220	157	96	37	5	3	1	..	1276	....	14.23
Total on all women—																
Regular from the first	12	51	191	317	440	285	206	114	31	11	2	1	..	1670	14.20	
" afterwards	5	24	60	88	93	72	54	36	20	7	1	..	..	460	14.23	
" never......	2	6	23	32	49	29	28	18	10	2	..	..	1	200	14.42	
Total............	19	81	274	437	591	386	288	168	61	20	3	1	1	2330	....	14.23

The average age at first menstruation, as given in the above table for all women, is 14.23 years. It will be noted that there existed no material difference between the average given for the unmarried, sterile, or fruitful. But on comparing these results with those given in Table VIII., where the relation of puberty to regularity and pain of menstruation is shown, a slight discrepancy will be detected. This is due to the fact that a number of cases which were chiefly surgical in character, were included in Table I., and excluded by accident from the other. The average, as shown in Table VIII., for the unmarried is nearly the same. But the sterile were found to have first menstruated at a little earlier period, and the fruitful about twenty-six days sooner than the average given above. With this explanation we may accept the average of 14.14 years as the proper one for those women who suffered in after life from uterine disease, while a mean between the two averages would be 14.18, or fourteen years and sixty-five days.

The earliest age at which puberty has occurred under my observation has been ten years, and the latest twenty-three years. By reference to Table I., it will be seen that nineteen females menstruated for the first time at this early age. That the flow was not an accidental bleeding is shown by twelve of these having remained regular from that time, and five became so within a year, while the remaining two cases were never regular. The connection between the age of puberty and childbearing will be referred to hereafter. As a curious circumstance, however, I may state that the eleven fruitful women who menstruated for the first time at ten years of age were impregnated fifty-nine times, and that the average number of children borne by these was greater than for those who commenced to menstruate at any other year, while their average age of marriage was 18.25 years. The ages of ten and nineteen bear the closest relation to each other in reference to first menstruations, and are almost the extremes, since the table shows that the likelihood of development after the latter age is very small, giving but three instances of puberty at twenty, and but one each for the age of twenty-one and twenty-three years.

In Table II. is given the proportion of unmarried, sterile, and fruitful women, and also the percentage on the total number of those who menstruated for the first time at any given age.

The proportion menstruating for the first time at fourteen, the nearest even age to the general average, is 25.36 of the total number. Of those first menstruating below fourteen years of age, the number of sterile women, in proportion to the whole number of sterile, was greater by three per cent. than the number of fruitful to their whole number: due to the fact that the number of sterile women menstruating at thirteen was nearly as great as at fourteen years of age. Above the age of fourteen there existed but little difference in the relative proportion of sterile and fruitful women who developed late.

TABLE II.—*Average Menstrual Age.*

Age at first menstruation……	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	23.	Total.
Unmarried……..	3	14	41	80	117	62	51	26	10	5	..	..	..	409
Percentage….	0.71	3.43	10.03	19.57	28.61	15.15	12.47	6.35	2.44	1.22				
Sterile…………	5	19	72	144	150	104	80	46	14	10	..	..	1	645
Percentage….	0.77	2.94	11.16	22.32	23.25	16.12	12.40	7.13	2.17	1.55	..	..	0.15	
Fruitful……….	11	48	161	213	324	220	157	96	37	5	3	1	..	1276
Percentage….	0.86	3.76	12.61	16.69	25.39	17.24	12.30	7.52	2.89	0.39	0.23	0.07		
Total for each year	19	81	274	437	591	386	288	165	61	20	3	1	1	2330
Percentage….	0.81	3.47	11.76	18.76	25.36	16.56	12.36	7.21	2.61	0.85	0.12	0.04	0.04	

REGULARITY OF MENSTRUATION.—It is shown by Table III. that of two thousand four hundred and forty-seven women 72.33 per cent. were regular from the beginning, 18.92 per cent. were regular after a certain time, and 8.74 per cent. were never regular.

TABLE III.—*Regularity of Menstruation.*

	Unmarried.	Sterile.	Fruitful.	Total.
Regular from the first	271	453	1046	1770
Percentage	64.37	67.51	77.19	72.33
Regular afterwards	81	145	237	463
Percentage	19.23	21.60	17.49	18.92
Never regular	69	73	72	214
Percentage	16.38	10.88	5.31	8.74
Total	421	671	1355	2447
Percentage	17.20	27.42	55.37	

The average length of time for all before becoming regular was about eighteen months and three days after the first appearance of menstruation.

This table shows the influence of marriage in bringing about regularity of the menstrual flow, since the proportion of the sterile who were never regular, is smaller than that for the unmarried women. It shows, also, the effect of pregnancy as being even more decided, since a large proportion of the fruitful women could only have become regular after child-birth.

The total number in Table III. is made up of those under my care of whom I had a complete record. This number, with the relative proportion there given of the unmarried, sterile, and fruitful women, will be used hereafter as the standard for comparison as to the liability of either class to any special disease.

TABLE IV.—*Regularity of Menstruation as to Age.*

Menstrual age ...	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	23.	Total.
Regular from the first............	12	51	191	317	449	285	206	114	31	11	2	1	..	1670
Percentage..	0.71	3.05	11.40	18.98	26.88	17.06	12.33	6.82	1.85	0.65	0.12	0.06	..	71.26
Regular afterwards..........	5	24	60	88	93	72	54	36	20	7	1	..	..	469
Percentage..	1.08	5.21	13.04	19.13	20.21	15.65	11.73	7.82	4.34	1.52	0.21	..	..	19.71
Never regular...	2	6	23	32	49	29	28	18	10	2	..	..	1	200
Percentage..	1.00	3.00	11.50	16.00	24.50	14.50	14.00	9.00	5.00	1.00	..	..	0.50	8.99
Total for each year...........	19	81	274	437	591	386	288	168	61	20	3	1	1	2330

There is given in Table IV., for each year of first menstruation, the proportion of those who were regular from the first show, those regular after a certain time, and those who were never regular. This Table is of more interest as a part of the history of menstruation than for any practical deduction to be drawn from it other than of a negative character. It shows, with but a variation of two or three per cent., that about the same proportion are regular or irregular for any one year. The proportion of those who were regular and menstruated for the first time, either above or below the average age of puberty, is about the same; and the same is true of those who became regular afterwards. But for the class who were never regular, the proportion is 12.50 per cent. greater for those menstruating above the average age of puberty than below it, showing that a larger proportion of those who were never regular menstruated for the first time late, or above the average age.

It is indicated by Table V. that in a state of health, menstruation should be free from pain. We shall see hereafter that pain, in the beginning of the flow, at puberty is not, as a rule, a symptom of disease but of a form of congenital flexure of the uterine neck.

TABLE V.—*Condition of Pain during Menstruation.*

NUMBER OF CASES. (*With percentage of each condition.*)	Unmarried.	Sterile.	Fruitful.	Total.
With pain in the beginning of the flow	57	135	105	297
Percentage	19.19	45.45	35.35	13.63
With pain during the flow	84	151	59	294
Percentage	28.57	51.36	20.06	13.49
Free from pain	209	311	1067	1587
Percentage	13.17	19.59	67.23	72.90
Total	350	597	1231	2178

We may assume, therefore, from a total of two thousand one hundred and seventy-eight women, that but 13.49 per cent. gave indication at puberty of a condition which, in after life, would render the individuals more liable to disease. We shall see when considering the different forms of flexures, that the character of the pain at this period of life is sometimes an indication of a condition which may necessitate a resort to local treatment, even at so early an age. I cannot now enter on this subject at greater length without repetition hereafter. But I would call the attention of the reader to the fact, pointed out by Table V., that more than half of all the women, who at puberty suffered pain during the flow, were sterile in after life. If we exclude the unmarried (since we cannot know the proportion of those who would be sterile), we will find that of all married women, who at puberty suffered pain during the flow, over 71 per cent. were sterile.

Table VI. is intended to give the proportion of cases with pain, at the beginning of and during the flow, and those free from it, for each menstrual age, in connection with regularity: and the averages are taken on the total number of each condition as to regularity.

Table VII. also gives the proportion who suffered pain, or who were free from it, in connection with the degree of regularity, but the averages are taken on the total number menstruating for each year, and not on the whole number under observation.

Table VI.—*Condition of Menstruation as to Pain, if any, at the beginning of or during the Flow.*

Age at first menstruation	10.			11.			12.			13.			14.			15.		
Time of menstruation when pain was felt.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.
Regular from the first............	2	....	8	10	7	29	23	20	151	44	44	227	67	53	348	31	34	197
Percentage	00.90	....	00.65	4.78	3.60	2.35	11.00	10.30	12 27	21.05	22.68	18.45	32.05	27.31	28.29	14.82	17.52	16.01
Regular afterwards..............	....	....	3	4	2	11	6	6	40	16	11	44	11	14	38	6	12	33
Percentage	....	....	1.26	7.54	3.50	4.62	11.32	10.54	16.80	30.18	19.29	18.48	20.75	24.56	15.88	11.32	21.05	13.86
Never regular	1	....	2	....	2	6	3	5	13	7	9	15	10	10	26	6	5	18
Percentage	2.84	....	1.68	....	4.64	5.04	8.57	11.62	10.92	20.00	20.93	12.60	28.57	23.30	21.84	17.14	11.62	15.12
Total number for each age.......	16			71			267			417			577			342		
Percentage for each age...... ..	0.73			3.26			12.26			19.15			26.46			15.71		

Age at first menstruation	16.			17.			18.			19.			20.	21.	23.	For all ages.			
Time of menstruation when pain was felt.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During	No pain.	Beginning.	During.	No pain.	No pain.	No pain.	No pain.	Beginning.	During.	No pain.	Total.
Regular from the first............	21	19	147	8	12	87	1	4	26	2	1	8	2	....	....	209	194	1230	1633
Percentage	10.04	9.75	11.95	3.82	6.18	7.07	00.47	2.06	2.11	00.90	00.51	00.65	00.16	....	....				
Regular afterwards..............	4	6	26	6	2	23	....	3	11	....	1	7	1	1	....	53	57	238	348
Percentage	7.54	10.59	10.92	11.32	3.50	9.66	....	5.26	4.62	....	1.75	2.94	00.42	00.42	....				
Never regular	4	2	21	3	5	8	1	4	4	....	1	2	....	....	1	35	43	119	197
Percentage	11.42	4.64	20.16	8.57	11.62	6.72	2.84	9.30	3.36	....	2.32	1.68	....	....	00.87				
Total number for each age.......	253			154			54			22			3	1	1	297	294	1587	2178
Percentage for each age	11 62			7.07			2.48			1,01			0.14	0.05	0.05				

TABLE VII.—*Condition of Menstruation as to Pain, etc.*

Age at first menstruation	10.			11.			12.			13.			14.			15.		
Time of menstruation when pain was felt.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.
Unmarried—																		
Regular from the first	1	..	1	2	1	3	4	6	13	6	7	35	15	14	49	3	12	18
Regular afterwards	..	..	..	2	2	..	..	3	4	2	4	7	2	7	2	1	3	3
Never regular	..	..	1	..	1	1	1	2	5	1	1	5	1	3	6	4	..	6
Sterile—																		
Regular from the first	1	..	2	4	2	6	5	12	24	24	28	53	31	28	53	17	15	42
Regular afterwards	..	..	1	1	..	2	3	3	6	8	4	9	5	4	7	1	5	7
Never regular	..	..	1	..	1	..	2	1	4	4	5	5	6	4	6	1	4	6
Fruitful—																		
Regular from the first	..	..	5	4	4	20	14	2	114	14	9	139	21	11	246	11	7	137
Regular afterwards	..	..	2	1	..	9	3	..	30	6	3	28	4	3	29	4	4	23
Never regular	1	..	..	..	..	5	..	2	4	2	3	5	3	3	14	1	1	6
Summary—																		
Regular from the first	2	..	8	10	7	29	23	20	151	44	44	227	67	53	348	31	34	197
Percentage	20.00	..	80,00	21.74	15.21	63.04	11.85	10.31	77.83	13.96	13.96	72.03	14.31	11.30	74.35	11.83	12.97	75.11
Regular afterwards	..	..	3	4	2	11	6	6	40	16	11	44	11	14	38	6	12	33
Percentage	..	..	100.00	23.52	11.76	64.70	11.53	11.53	76.72	22.53	15.49	61.97	17.46	22.22	60.31	11.76	23.53	64.70
Never regular	1	..	2	..	2	6	3	5	13	7	9	15	10	10	26	6	5	18
Percentage	33.33	..	66.66	..	25.00	75.00	14.28	23.81	61.90	22.58	29.03	48.38	21.78	21.78	56.52	20,68	17.24	62.06
Total as to condition	3	..	13	14	11	46	32	31	204	67	64	286	88	77	412	43	51	248
Percentage	18.75	..	81.25	19.72	15.49	64.79	11.98	11.61	76.40	16.06	15.35	68 58	15.28	13.37	71.35	12.57	14.91	72.51
Totals for each menstrual year	16			71			267			417			· 577			342		

TABLE VII.—*Continued.*

Age at first menstruation	16.			17.			18.			19.			20.	21.	23.	For all ages.				
Condition as to pain, etc.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	No pain.	No pain.	No pain.	Beginning.	During.	No pain.	Total.	Percentage.
Unmarried—																				
Regular from the first..........	4	4	21	2	6	7	..	1	3	..	..	2	..	..	..	37	51	152	240	68.60
Regular afterwards............	..	3	4	3	1	2	..	2	1	..	..	1	..	..	..	10	25	24	59	16.85
Never regular	1	..	3	1	1	3	1	..	1	..	..	2	..	..	..	10	8	33	51	14.57
																			350	
Sterile—																				
Regular from the first..........	10	14	27	3	5	23	1	2	2	2	1	3	..	..	..	98	107	235	440	73.70
Regular afterwards............	2	3	9	1	1	3	..	..	..	..	1	1	..	..	..	21	21	45	87	14.57
Never regular	2	2	4	1	2	2	..	3	2	..	1	..	..	..	1	16	23	31	70	11.72
																			597	
Fruitful—																				
Regular from the first	7	1	99	3	1	57	..	1	21	..	..	3	2	..	..	74	36	843	953	77.32
Regular afterwards............	2	..	13	2	..	18	..	1	10	..	..	5	1	1	.	22	11	169	202	16.40
Never regular.................. ..	1	..	17	1	2	3	..	1	1	..	..	..	..	..	..	9	12	55	76	6.17
																			1231	
Summary—																				
Regular from the first	21	19	147	8	12	87	1	4	26	2	1	8	2	..	..	209	194	1230	1633	74.97
Percentage	11.23	10.16	78.07	7.47	11.21	81.21	3.22	12.90	83.89	18.18	9.09	72.72	100.	..	..	12.79	11.88	75.31	..	
Regular afterwards.	4	6	26	6	2	23	..	3	11	..	1	7	1	1	..	53	57	238	348	15.97
Percentage	11.11	16.66	72.22	19.35	6.45	74.19	..	21.42	78.57	..	12.50	87.50	100.	100.	..	15.23	16.37	68.39	..	
Never regular	4	2	24	3	5	8	1	4	4	..	1	2	..	..	1	35	43	119	197	9.00
Percentage	13.33	6.66	80.00	18.75	31.25	50.00	11.11	44.44	44.44	..	33.33	66.66	..	..	100.	17.76	21.82	60.40	..	
Total as to condition...........	29	27	197	17	19	118	2	11	41	2	3	17	3	1	1	297	294	1587	2178	
Percentage	11.46	10.67	77.86	11.04	12.34	76.62	3.70	20.37	75.93	9.09	13.63	77.27	100.	100.	100.	13.63	13.49	74.87		
Totals for each menstrual year	253			154			54			22			3	1	1					

TABLE VIII.—*Regularity of Menstruation, and average age at Puberty.*

	REGULAR FROM THE FIRST.				REGULAR AFTERWARDS.				NEVER REGULAR.				TOTAL.			
	Unmarried.	Sterile.	Fruitful.	Total.	Unmarried.	Sterile.	Fruitful.	Total.	Unmarried.	Sterile.	Fruitful.	Total.	Unmarried.	Sterile.	Fruitful.	Summary.
Number with pain in the beginning . .	37	98	74	209	10	21	22	53	10	16	9	35	57	135	105	297
Average age at puberty	13.81	14.10	13.41	13.85	14.20	13.57	14.13	13.84	15.00	14.00	14.00	14.28	14.08	14.06	13.67	13.99
Number with pain during the flow . .	51	107	36	194	25	21	11	57	8	23	12	43	84	151	59	294
Average age at puberty	14.39	14.12	14.02	14.12	14.16	14.42	14.54	14.31	13.37	14.91	14.32	14.46	14.22	14.28	14.00	14.21
Number free from pain	152	235	843	1230	24	45	169	238	33	31	55	119	209	311	1067	1587
Average age at puberty	14.19	14.17	14.08	14.11	14.45	14.17	14.34	14.32	14.39	14.64	14.46	14.48	14.21	14.22	14.14	14.17
Total number . . .	240	440	953	1633	59	87	202	348	51	70	76	197	350	597	1231	2178
average ages .	14.17	14.14	13.92	14.08	14.28	14.09	14.32	14.25	14.35	14.58	14.38	14.44	14.22	14.18	14.09	14.14

These tables seem to indicate that menstruation, when the flow is regular, is less painful when the development occurs after fourteen than when it takes place before that age. But for those who were never regular, a larger proportion suffered when puberty took place after the average age. Without reference to regularity, it is shown in Table VII., by the percentages for each menstrual year, that the proportion of those who were free from pain is decidedly greater when puberty took place above the average age. Over seventy-five per cent. of all the women (see Table VII.) were regular and free from pain, while fifteen per cent. more suffered from pain, who were never regular.

When pain existed only at the beginning of the flow, it is indicated by Table VIII., that all women menstruate for the first time at an earlier age than under any other condition. Those who were free from pain developed a little later in life, and where the dysmenorrhœa continued during the period, puberty was delayed about a month longer, on an average, than in those cases in which pain occurred only at the beginning. The average on the total number was 14.14 years, and approached nearest to that found where the flow had been free from pain.

The average age for the fruitful women, who were regular from the first but with pain in the beginning of the flow, was found to be earlier than that of the sterile or unmarried, under either condition, that is, as to the existence or absence of pain. The reverse, however, is true in comparison with the sterile, where menstruation became regular afterwards, since in this condition puberty was delayed with the fruitful women. The number of those who were never regular is almost too small to furnish any definite data, yet the average age for the fruitful is earlier than for either the sterile or unmarried women. On the general average the age of puberty, under all conditions, as to pain, is also at the earliest date for those who were fruitful in after life.

Unfortunately, we have no data to show the average age at puberty of those who were healthy in after life. Until this is known, all comparison must be based on the different degrees of liability to disease, if the age at puberty has any relation to the subsequent state of health. We have already seen that the average age at puberty, as taken from the observations cited by Dr. Tilt, is 14.92 years. The results of my observations seem to show that women in this country develop at an earlier age than in England. But before we can arrive at any definite conclusion, the comparison must be made between those of corresponding stations in life. I assume, in the absence of any evidence to the contrary, that the observations in England were made upon the same class of women as are treated in the public institutions of this country. If so, any comparison would lead to error, since I am convinced that careful records would show that the average for the same class of patients in this country would approximate nearer to the English average than to the one I have given. If it be shown that the average age at puberty, for the better classes of England, is so much later than in this country, it would indicate that a larger proportion of our women are sterile; or, when fruitful, more liable to disease and early loss of youth.

The average duration of menstruation at puberty is shown by Table IX. to be, for all women, 4.82 days. For the class of cases fruitful in after life, the duration was 4.91 days, and of greater length than the general average found for either the unmarried or sterile. The average for the sterile was 4.74 days, and for the unmarried the flow was of shorter duration than for any other class of women.

This table establishes one point beyond question, viz., that the local condition which gives rise to pain exercises a marked influence in increasing the menstrual flow beyond the general average as to duration, but not necessarily as to quantity.

In the absence of pain, menstruation, for all women, lasted for a shorter time than when pain was present. When the pain existed during the period, the flow was prolonged to a greater length than the average time found for those who only suffered pain at the beginning. The average length of the flow, with pain at the beginning, is very nearly the same for the unmarried and fruitful, but is less for the sterile. This circumstance would indicate that the sterile suffered less pain than either the fruitful or the unmarried, which is apparently in contradiction to the general law. But we must look to some other cause exerting an influence specially on the condition which, in after life, is to result in sterility. The general law is proved by the averages obtained for the unmarried, sterile, and fruitful, separately, and confirmed when taken on the total number collectively.

It will be noted, also, that the fruitful women who suffered pain during the flow menstruated for a longer period than either the unmarried or sterile, and, consequently, this class of cases must have suffered more from dysmenorrhœa. We must assume this result to be due to some accidental cause, for the number of cases is compara-

TABLE IX.—*Condition of Menstruation as to Pain, at the Beginning, during the Flow, or free from Pain.*

	Age of first menstruation..........	10.			11.			12.			13.			14.			15.		
	Condition of menstruation as to pain, etc.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.
Unmarried.	Number of, for each condition of flow....................	1	....	2	4	4	4	5	11	22	9	12	47	18	24	57	8	15	27
	Length of menstruation for each condition in days......	7.00	....	6.00	6.75	5.50	5.75	5.00	4.91	4.27	4.66	5.66	4.47	4.88	4.91	4.51	4.37	5.00	4.74
	Average length of menstruation for each age...........	6.33			6.00			4.55			4.70			4.67			4.76		
Sterile.	Number of, for each condition of flow....................	1	....	4	5	3	8	10	16	34	36	37	67	42	36	66	19	94	55
	Length of menstruation for each condition in days......	4.00	....	3.75	4.40	5.33	5.00	5.60	5.31	4.94	5.08	5.11	4.92	4.21	5.19	4.75	4.79	5.04	4.25
	Average length of menstruation for each age...........	3.80			4.87			5.15			5.01			4.70			4.55		
Fruitful.	Number of, for each condition of flow....................	1	..	7	5	4	33	16	4	137	22	15	159	28	16	259	16	12	150
	Length of menstruation for each condition in days......	4.00	....	5.00	4.60	7.25	5.30	4.81	4.25	4.76	5.27	5.26	4.64	5.28	5.18	5.08	4.94	5.08	4.77
	Average length of menstruation for each age...........	4.87			5.40			4.75			4.76			5.10			4.80		
Summary.	Total for each condition of flow........................	3	....	13	14	11	45	31	31	193	67	64	273	88	76	382	43	51	232
	Length of menstruation on the total for each condition.....	5.00	....	4.76	5.14	6.09	5.28	5.09	5.03	4.74	5.08	5.25	4.68	4.63	5.10	4.93	4.76	5.04	4.64
	Average length of flow on the	[illegible]			[illegible]			[illegible]			[illegible]			4.92			4.72		

TABLE IX.—*Continued.*

Age of first menstruation		16			17.			18.			19.			20.	21.	23.	Summary.			
	Condition of menstruation as to pain, etc.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	Beginning.	During.	No pain.	No pain.	No pain.	No pain.	Beginning.	During.	No pain.	Total.
Unmarried.	Number of, for each condition of flow	5	7	28	6	8	12	1	3	5	....	....	5	....	....	....	57	84	209	350
	Length of menstruation for each condition in days	5.00	5.00	3.78	5.50	4.62	4.08	2.00	3.33	5.80	....	....	3.80	....	....	....	4.98	4.98	4.43	
	Average length of menstruation for each age	4.15			4.58			4.55			3.80			....	....	....	4.65			
Sterile.	Number of, for each condition of flow	14	19	40	5	8	28	1	5	4	2	3	4	....	....	1	135	151	311	597
	Length of menstruation for each condition in days	4.28	5.05	4.05	4.05	3.87	4.60	6.00	3.40	7.00	3.00	4.33	5.25	....	....	1.00	4.62	5.00	4.63	
	Average length of menstruation for each age	4.35			4.61			5.10			4.44			....	....	1.00	4.74			
Fruitful.	Number of, for each condition of flow	10	1	116	6	3	72	....	3	27	....	....	8	2	1	....	104	58	971	1133
	Length of menstruation for each condition in days	4.20	6.00	4.96	4.50	6.66	5.00	....	3.33	4.52	....	....	5.50	3.00	4.00	....	4.96	5.08	4.88	
	Average length of menstruation for each age	4.91			5.02			4.40			5.50			3.00	4.00	....	4.91			
Summary.	Total for each condition of flow	29	27	184	17	19	112	2	11	36	2	3	17	2	1	1	296	293	1491	2080
	Length of menstruation on the total for each condition	4.38	5.07	4.58	5.23	4.63	4.80	4.00	3.36	4.97	3.00	4.33	4.94	3.00	4.00	1.00	4.83	5.04	4.77	
	Average length of flow on the total for each age	4.61			4.83			4.57			4.68			3.00	4.00	1.00	4.82			

tively so small that the average would be easily affected by individual peculiarities.

We have shown that painful menstruation is abnormal, and it has been proven that pain lengthens the duration of the flow. Therefore, as the difference exists chiefly between the two classes, afterwards sterile and fruitful, it must be attributed to accident, since, if any condition exists at puberty which would determine the subsequent sterility, those afterwards fruitful would at puberty have approached, by comparison, nearer to a normal standard.

Table IX. also gives the average length of menstruation for each year and for each condition, as to pain, for the unmarried, sterile, and fruitful, as well as for the total number.

The only marked exceptions to the general laws, already stated, are to be found at either extreme, and where the number is small. The longest duration of the flow in the total number and for the fruitful is found to be for those who menstruated for the first time at eleven years, and for the sterile at twelve years of age.

TABLE X.—*Giving the Average Length of the Flow for those who Menstruated for the first time above or below the age of Fourteen.*

	Sterile.		Fruitful.		On the total number unmarried, sterile, and fruitful.	
	Above Fourteen.	Below Fourteen.	Above Fourteen.	Below Fourteen.	Above Fourteen.	Below Fourteen.
With pain at the beginning of the flow	4.68	5.09	4.62	5.00	4.83	5.12
With pain during the flow	4.71	5.17	4.57	5.43	4.79	5.27
Free from pain	4.35	4.91	4.83	4.76	4.67	4.68
Average length of menstruation on the total number	4.50	5.01	4.85	4.82	4.68	4.80

It will be seen by Table X. that the flow lasted longer for the total number and for the sterile who menstruated for the first time below the age of fourteen, while for the fruitful, the reverse was found. The greatest difference between the two averages was found for the sterile. When menstruation was accompanied with pain, and puberty took place below the age of fourteen, the flow was longer under all conditions than when free from pain. The average on the total number is not

TABLE XI.—*Length and Regularity of Menstruation.*

	REGULAR FROM THE FIRST.				REGULAR AFTERWARD.				NEVER REGULAR.				SUMMARY.			
	Unmarried.	Sterile.	Fruitful.	Total cases and average length of period.	Unmarried.	Sterile.	Fruitful.	Total cases and average length of period.	Unmarried.	Sterile.	Fruitful.	Total cases and average length of period.	Unmarried.	Sterile.	Fruitful.	Total cases and duration of period.
Number of cases with pain at the beginning of the flow	37	98	74	209	10	21	22	53	10	16	8	34	57	135	104	296
Average length of menstruation— At puberty	5.05	4.53	4.87	4.79	5.40	5.38	5.36	5.37	4.30	4.12	4.62	4.29	4.98	4.62	4.96	4.83
In after life	4.80	4.41	4.88	4.64	4.90	4.57	5.36	4.96	4.55	3.76	4.62	4.23	4.77	4.37	4.97	4.66
Number of cases with pain during the flow	51	107	36	194	25	21	11	57	8	23	11	42	84	151	58	293
Average length of menstruation— At puberty	5.09	5.16	5.28	5.17	5.08	4.66	6.27	5.15	4.00	4.52	4.18	4.33	4.98	5.00	5.08	5.04
In after life	4.96	4.95	5.20	5.00	5.00	4.33	6.50	5.01	3.50	4.77	3.27	4.12	4.83	4.84	5.05	4.87
Number of cases free from pain	152	235	756	1143	24	45	163	232	33	31	52	116	209	311	271	1491
Average length of menstruation— At puberty	4.43	4.64	4.92	4.80	4.33	4.68	4.78	4.72	4.51	4.51	4.55	4.53	4.43	4.63	4.88	4.77
In after life	4.69	4.64	4.96	4.85	4.42	4.53	4.81	4.72	4.06	4.78	4.58	4.49	4.56	4.64	4.91	4.81
Total number of cases under all conditions	240	440	866	1546	59	87	196	342	51	70	71	192	350	597	1133	2080
Average length of menstruation— At puberty	4.62	4.77	4.94	4.65	4.83	4.85	4.93	4.89	4.30	4.43	4.50	4.44	4.65	4.74	4.91	4.82
In after life	4.72	4.66	4.96	4.85	4.77	4.49	4.96	4.81	4.06	4.57	4.38	4.36	4.67	4.63	4.93	4.66

only made out for those who were afterwards sterile or fruitful, but also includes those who remained unmarried.

By the plan followed in Table XI. any change in the menstrual flow in after life can be seen from the average duration which existed at puberty.

The influence exerted by regularity and pain, in determining the length of the period, is also shown for the unmarried, sterile, and fruitful women separately, and there is a summary for the total number.

Two thousand and eighty women commenced their menstrual life with the flow averaging 4.82 days, and it is shown by this table that the average in after life, for the same females, was reduced to 4.66 days.

The duration of flow was shortened in after life for all the unmarried and sterile women, but for the former class the change was most marked. With the fruitful women, however, the period became somewhat lengthened. The general law is noted as to the connection between the degree of pain and shortened duration of the menstrual flow, when the averages are taken on the total number for each condition. For all classes of women there was a slight increase in the length of flow when it became free from pain in after life. Where pain had existed, the change was greatest, as shown in the reduction of the length of flow for the sterile women, while the average remained but little changed for the fruitful with either condition, as to pain. The increased duration for those who had been free from pain was almost entirely confined to the unmarried.

On the total number who were regular from the first, no change took place in after life, the average duration of flow remaining the same as it was at puberty. But for all women who were regular yet suffered from pain, the time of flow was shortened. The only apparent exception to the general rule was with the fruitful women, who had pain in the beginning of the flow, and for this class there was practically no change. Where the flow had been free from pain, but regular from the beginning, the average for the unmarried and fruitful women was lengthened, while that for the sterile remained unchanged.

In all women who become regular after a certain time, the menstrual flow was shortened in after life. Under the same classification the period became lessened also with all women who suffered from pain. When free from pain the average duration was increased for the unmarried, and lessened for the sterile women, but on the total average it became shortened for both classes. The average for the fruitful women remained unchanged from puberty where pain had existed at the beginning of the flow, but under each other condition and on the total number it was also lessened in duration.

The average for the total number of women who were never regular shows that the period became, in the same manner, shortened during after life. On making a comparison between each class of women, it is found that the average was reduced for the unmarried and fruitful while the flow was lengthened for the sterile. For the total number of women who had suffered pain either at the beginning, or during the flow, or had been free from pain, and had never been regular, the flow became less. As was the case with those who had become regular afterwards, but suffered pain at the beginning of the period, the unmarried of this class, who were never regular, menstruated for a longer time in after life, while the average for the fruitful remained unchanged. Under the same conditions, the duration was shortened for the sterile women. With pain during the flow, the average was reduced for the unmarried and fruitful women, but increased for the sterile. In this absence of pain, the unmarried menstruated afterwards for a much shorter time than at puberty, while the flow was increased greatly for the sterile and, to a less degree, for the fruitful women.

Menstrual Changes in Quantity and Duration.—We have shown in Table XII. various changes which took place after puberty in the menstrual flow of one thousand nine hundred and ninety women. By comparison with Table XI., it will be seen that a difference exists in the two tables between the averages given of the length of the menstrual flow at puberty and in after life. These are, however, so slight that the difference could easily have resulted from individual cases, and are really of little practical importance, since they bear about the same proportion to each other.

By reference to the lower division of Table XII. it will be seen that with 1349 women, or 67.28 per cent. of the whole number, the length of menstruation remained from puberty unchanged. But of these a certain proportion had the quantity altered. In the first section of those with whom the time remained the same, a certain proportion were normal, too free, or scanty in quantity from puberty, and their condition so remained. For the second section of the same division the quantity became increased, lessened, or irregular, but the length of flow continued also unchanged. The average duration of the menstrual flow is given for each condition as to quantity, and, in the next column, the percentage on the whole number of cases belonging

TABLE XII.—*Condition of Menstruation at Puberty, with Changes in After Life in both Length and Quantity.*

NOTE.—Figures referring to duration or length of menstruation denote the time in days.		REMAINED UNCHANGED IN LENGTH						SUMMARY.			CHANGED IN LENGTH, IN AFTER LIFE,						SUMMARY.				SUMMARY FOR ALL CONDITIONS.			
		and quantity, being from the beginning,			but the quantity became afterwards either			Where menstruation in after life remained unchanged in length.			being increased, and the quantity either			being lessened, and the quantity either			Where menstruation in after life became changed both in length and quantity.							
		Normal.	Too free.	Scanty.	Increased.	Lessened.	Irregular.	Number of cases.	Average length of period.	Percentage for each condition.	Increased.	Lessened.	Irregular.	Lessened.	Increased.	Irregular.	Number of cases.	Average length of period at puberty.	Average length of period in after life.	Percentage for each condition.	Total number of cases.	Average length of the period at puberty.	Average length of the period in after life.	Percentage of the total number for all conditions.
Unmarried.	Normal	73	......	......	......	......	......	73	4.80	31.73	......	......	......	......	......	......	......	......	......	......	73	4.80	4.80	22.67
	Too free	......	23	......	......	......	......	23	6.52	10.00	......	......	......	......	......	......	......	......	......	......	23	6.52	6.52	7.14
	Scanty	......	......	31	......	......	......	31	2.83	13.47	......	......	......	......	......	......	......	......	......	......	31	2.83	2.83	9.62
	Increased	......	......	......	44	......	......	44	5.20	19.13	39	......	......	......	4	......	43	3.86	5.76	46.73	87	4.54	4.75	27.01
	Lessened	......	......	......	......	40	......	40	4.27	17.39	......	2	......	39	......	......	41	5.60	2.87	44.56	81	4.95	4.56	25.15
	Irregular	......	......	......	......	......	19	19	4.63	8.26	......	......	5	......	......	3	8	4.37	5.25	8.69	27	4.55	4.81	8.38
	Number	......	......	......	......	......	......	230	4.68	......	......	......	......	......	......	......	92	4.68	4.43	......	322	4.68	4.61	
	Percentage for each condition.	22.67	7.14	9.62	13.64	12.42	5.90	......	......	71.42	12.11	.62	1.55	12.11	1.24	.93	......	......	......	28.57				
Sterile.	Normal	121	......	......	......	......	......	121	4.68	31.78	......	......	......	......	......	......	......	......	......	......	121	4.68	4.68	21.45
	Too free	......	33	......	......	......	......	33	6.60	8.66	......	......	......	......	......	......	......	......	......	......	33	6.60	6.60	5.85
	Scanty	......	......	55	......	......	......	55	3.14	14.43	......	......	......	......	......	......	......	......	......	......	55	3.14	3.14	9.75
	Increased	......	......	......	71	......	......	71	5.23	18.63	64	......	......	......	3	......	67	4.26	6.94	36.61	138	4.76	6.06	24.46
	Lessened	......	......	......	......	78	......	78	4.39	20.47	......	5	......	93	......	......	98	5.72	3.03	53.55	176	5.13	3.63	31.20
	Irregular	......	......	......	......	......	23	23	4.00	6.03	......	......	12	......	......	6	18	4.02	4.72	9.83	41	4.02	4.31	7.26
	Number	......	......	......	......	......	......	381	4.63	......	......	......	......	......	......	......	183	5.02	4.62	......	564	4.76	4.63	
	Percentage for each condition.	21.45	5.85	9.75	12.58	14.	4.07	......	......	67.55	11.34	.88	2.12	16.48	.53	1.06	......	......	......	32.44				

TABLE XII.—(Continued.)

Fruitful.	Normal	185	......	......	......	......	......	185	4.66	25.06	......	......	......	......	......	......	......	......	......	......	185	4.66	4.66	16.75
	Too free	......	50	......	......	......	......	50	6.58	6.77	......	......	......	......	......	......	......	......	......	......	50	6.58	6.58	4.32
	Scanty	......	......	50	......	......	......	50	2.72	6.77	......	......	......	......	......	......	......	......	......	......	50	2.72	2.72	4.52
	Increased	......	......	......	265	......	......	265	5.43	35.90	170	......	......	......	10	......	160	4.15	5.00	40.18	445	4.93	5.27	40.30
	Lessened	......	......	......	......	113	......	113	4.56	15.31	......	15	......	133	......	......	148	5.82	3.43	40.43	261	5.27	3.92	23.64
	Irregular	......	......	......	......	......	75	75	4.66	10.16	......	......	25	......	......	13	38	5.07	5.65	10.38	113	4.60	5.00	10.23
	Number	......	......	......	......	......	......	738	4.93	......	......	......	......	......	......	......	366	4.92	4.43	......	1104	4.93	4.96	
	Percentage for each condition,	16.75	4.52	4.52	24.00	10.23	6.79	......	......	66.84	15.39	1.35	2.26	12.04	.90	1.17	......	......	......	33.15				
Summary.	Normal	379	......	......	......	......	......	379	4.69	28.10	......	......	......	......	......	......	......	......	......	......	379	4.69	4.69	19.04
	Too free	......	106	......	......	......	......	106	6.57	7.85	......	......	......	......	......	......	......	......	......	......	106	6.57	6.57	5.32
	Scanty	......	......	136	......	......	......	136	2.91	10.08	......	......	......	......	......	......	......	......	......	......	136	2.91	2.91	6.83
	Increased	......	......	......	380	......	......	380	5.38	28.16	273	......	......	......	17	......	290	4.13	5.56	45.25	670	4.84	5.02	33.66
	Lessened	......	......	......	......	231	......	231	4.45	17.12	......	22	......	265	......	......	287	5.75	3.21	44.77	518	5.17	3.77	26.03
	Irregular	......	......	......	......	......	117	117	4.52	8.74	......	......	42	......	......	22	64	4.70	5.35	9.98	181	4.59	4.81	9.04
	Number for each condition,	379	106	136	380	231	117	......	......	......	273	22	42	265	17	22								
	Percentages on the total number of cases,	19.04	5.32	6.83	19.09	11.60	5.87	......	......	67.28	13.71	1.10	2.11	13.31	.85	1.10	......	......	......	32.21				
	Total number of cases	......	......	......	......	......	......	1349	......	......	......	......	......	......	......	......	641	......	......	......	1990			
	Av. length of menstruation: at puberty	4.69	6.57	2.91	5.38	4.45	4.52	......	4.80	......	4.07	4.27	4.42	5.88	5.17	5.22	......	4.92	......	......	......	4.84		
	in after life	4.69	6.57	2.91	5.38	4.45	4.52	......	4.80	......	5.71	6.54	6.50	2.93	3.05	3.13	......	......	4.58	......	......	......	4.70	

to this class; while in the lower division of the table is shown the percentage of each on the total number of women. Thus, with 19.04 per cent. of all under observation, the menstrual flow remained normal as to time and quantity, while the number of the same class was 28.10 per cent. of those with whom the time remained unchanged from puberty. In this connection it will be noted that a larger proportion of the unmarried remained normal and unchanged as to time and quantity, while the smallest percentage was for the fruitful women.

Of the total number under observation, 641 women, or 32.21 per cent., suffered a change in both time and quantity. In the first section of this division the time became lengthened, with the quantity either increased, lessened, or irregular. In the second section the duration of the flow became shortened, with the quantity lessened, increased, or irregular. The average length of menstruation at puberty is given, and with it the duration in after life.

For the purpose of explaining the table, we will take, as an example, the class with whom the menstrual flow was increased. Thus with 380 women, or 19.09 per cent. of the total number under observation, the time remained the same from puberty, but the quantity increased, while the average duration of flow was 5.38 days; and this group was 28.16 per cent. of those with whom the time remained unchanged; 273 cases, or 13.71 per cent. of the whole number, had the time lengthened and quantity increased; and below, in the same column, is shown the increase from 4.07 to 5.71 days; 17 cases, .85 per cent. of the whole, had the time shortened from 5.17 to 3.05 days, but the quantity was increased—thus making a total of 290 with whom the time was either lengthened or shortened, but, with both classes, the quantity increased. The average duration of flow at puberty for these cases was 4.13, and was lengthened to 5.56 days. These 290 cases formed 45.25 per cent. of the number with whom the quantity was increased, while the time was either lengthened or shortened. For the total number, 670 cases, the average duration of the menstrual flow at puberty was lengthened from 4.84 to 5.02 days, and this class formed 33.66 per cent. of the total number of women under observation.

It will be seen that a smaller proportion of the fruitful women commenced their menstrual life with the flow too free, than either of the sterile or the unmarried. But the percentage of fruitful with whom the flow increased in after life, is nearly twice as great as the proportion for either the sterile or unmarried under the same circumstances. On the other hand, the proportion is greatest for the sterile, and least for the fruitful women, when the flow became reduced in quantity after puberty. More than twice as many sterile as fruitful women had scanty menstruation at puberty, and the same proportion is found to continue in after life.

We have already seen that of the women who were afterwards fruitful a smaller proportion at puberty were irregular as to time than either of the sterile or unmarried. But as regards irregularity in quantity, this table shows the proportion to be greater for the fruitful women, who were not only irregular in this respect at puberty, but continued so during after life, showing that while irregularity as to time is often associated with sterility, this condition as to quantity is not a bar to fruitfulness.

There are other points in detail which would be of interest to the student as part of the history of menstruation, but they are of too little practical importance to the general reader to engage our attention at greater length.

CHAPTER X.

ABNORMAL CHANGES IN THE MENSTRUAL FLOW.

Deviations from the normal standard—Amenorrhœa—Scanty menstruation—Menorrhagia—Membranous dysmenorrhœa—Vicarious Menstruation—Hysteria.

NORMAL changes in the menstrual flow are to be regarded only as symptoms which have their origin often in opposite conditions, and require discrimination in their treatment. They are only grouped together for the consideration of common features, and that repetition may be avoided hereafter when treating of them separately.

Deviations from a normal standard may be classified under the following general heads:—

Changes
  in time, as to regularity and duration of flow.
  in quantity, from absence of menstruation to uterine hemorrhage.

These changes are frequently accompanied by certain

Nervous manifestations,
  Painful menstruation,
  Hysteria,
  Functional reflex disturbances.

All changes in time and quantity are so closely allied that the general consideration of one class must include the other.

We have fully considered elsewhere the absence of menstruation, due to retention, but in the condition now to be treated of, and termed amenorrhœa, there exists no obstruction to the escape of the menstrual flow. Amenorrhœa, a condition of the non-pregnant state, may be defined as a temporary suspension of the menstrual discharge after the organs of generation have reached a somewhat mature stage of development.

The opposite condition, *i. e.*, an excess as to quantity and duration, without reference to regularity, may be termed menorrhagia, to designate excessive menstruation, or, as a general term, metrorrhagia, or uterine hemorrhage. In practice every gradation in quantity will be found—from absence of, to excessive flow.

When amenorrhœa exists, the organs of generation are generally found sufficiently developed, and frequently no local disease can be detected to explain the suspension of function. The cause may lie in some defect in the ovary; but indirectly it is to be traced to a disturbance of the nervous system by which the nutrition of the whole body has become impaired. This is the rule, but apparent exceptions are met with where the general nutrition is not impaired and yet menstruation ceases or becomes scanty, and is attended with atrophy of the ovaries and uterus early in life; yet, after all, when these organs do undergo fatty degeneration, the change is but one of faulty nutrition.

Amenorrhœa does not always accompany an anæmic condition, since profuse menstruation often occurs in the early stages of phthisis and other diseases; but here, however, the rule is for nature to suspend the flow, as if to put a stop to all extra waste.

Atrophy of the uterus is often found in connection with amenorrhœa, not as the cause, but as an effect of a common cause. I have frequently observed atrophy taking place after the amenorrhœa had existed for some time.

It may be questioned if amenorrhœa can take place in health. When a sudden suppression of the menstrual flow occurs from emotional causes, or from exposure, it should be accepted as an evidence of some existing defect in the nervous system, although the woman may be at the time apparently in good health.

I have known an instance in which menstruation was suddenly arrested at the age of thirty by the announcement of the death of the woman's husband; although she had been apparently in good health her nervous system had been over-taxed by anxiety on account of her husband, and she never menstruated again; atrophy of the uterus took place soon after.

I have known a similar effect, and equally early in life, caused by a favorable verdict in a suit which had been the source of much protracted anxiety, and upon the result of which depended a condition of affluence or poverty.

Another instance I have known in which a young woman who had been previously in perfect health, over-strained her nervous system to gain the highest honors at one of the female colleges. During the time of her collegiate course she had menstruated regularly, although often too freely, but from the time she gained the prize she ceased to menstruate. Several years had elapsed, when I first saw her, and atrophy of the uterus had taken place.

A young woman may, by getting her feet wet, have the menstrual flow permanently arrested, and even atrophy of the uterus may follow; and although this cause of amenorrhœa is so unlike that founded in emotional disturbances, it is none the less effective. Every girl who gets her feet wet during the menstrual period does not necessarily suffer ill consequences, nor does every woman have suppression who has been exposed to a sudden nervous shock. There must exist a previous depression of innervation, which has rendered the sexual system too feeble to react from the effect of the shock, which, like a thunderbolt, expends its whole force on the sexual ganglia or nerve centres, and, consequently, being so overwhelmed, they no longer emit their normal influence. Each ganglion, it is thought, has the power of accumulating within itself a certain amount of nerve force, which it holds in readiness to resist shock. This force is essential to life, and while a portion is held in reserve for sudden demand, the rest is sent out to the various organs to maintain them as in a state of health. When this fails to reach any organ, its nutrition at once suffers, and atrophy naturally follows. When this nervous stimulus has been suspended sufficiently long to bring about atrophy of the uterus, we may naturally infer that the ovaries had previously suffered. Thus we have a rational explanation of functional disturbances, particularly as regards the uterus and ovaries.

If this hypothesis be correct, it necessarily narrows our field of treatment to improving, as far as possible, the general condition; and leaves but little to be expected from local means. I have seen, it is true, a temporary increase in the size of the uterus in consequence of the congestion following the use of sponge tents and electricity locally applied. But there can be no restoration of function, unless the general defect is remedied. To accomplish this, we must resort, if possible, to the means named in the chapter under the head of general treatment, with such changes or additions as the peculiarities of each case may suggest.

Scanty menstruation may be regarded as differing only in degree from amenorrhœa. As a rule, the same general causes that impair nutrition and diminish the amount of blood sent to the uterus will lessen the quantity of the flow, and a local congestion, or a condition by which the circulation is obstructed, will also produce the same result. This is strictly parallel to the dryness or suspension of secretion which is observed in other parts of the body when in a highly congested or inflamed state.

The condition of amenorrhœa, as well as that of a scanty flow, is often preceded for a period by profuse and irregular menstruation. The menstrual flow will frequently be very free after the recent occurrence of a backward version, but as the congestion increases, and a permanent retroflexion results, it will become both scanty and irregular. The same result is the rule with a flexure of the body above the vaginal junction. With cellulitis, the menstrual flow is almost always very free at first, but it becomes scanty afterwards, from obstruction to the circulation, as the parts which have been inflamed begin to contract. The growth of a fibroid may act mechanically so as to almost cut off the supply of blood, particularly if the woman has previously suffered from hemorrhage. Other examples might be cited, but as the various modes of treatment have nothing in common, they are deferred for consideration to their proper connections.

The unmarried woman between puberty and thirty-five years of age is sometimes liable to irregularity and a diminution in quantity of the flow, from the fact that she has not become a mother. But before she reaches the time for a change of life, the average length of the menstrual flow will be about the same as it was in the beginning, provided she has escaped the development of a fibrous growth in the uterus. The sterile woman will have the average lessened in after life, if she does not suffer from a fibrous tumor.

The woman who has borne children is liable to irregularity, and an increase in both the quantity and duration of the menstrual flow, with all her symptoms exaggerated, as she approaches the time for a change of life. The woman who has miscarried is more likely to become irregular and profuse in the flow than if she had carried a child to full term. After a criminal abortion, as a consequence of the cellulitis which occurs in every case almost without exception, the flow is usually scanty and irregular, although at first it may have been very profuse.

Menorrhagia.—Amenorrhœa is, as a rule, associated with an enfeebled or scanty circulation; menorrhagia, on the contrary, is always dependent on a local congestion, or on some remote obstruction to the circulation.

The general causes of menorrhagia may be classified as follows:—

Constitutional defects associated with anæmia.
Obstruction to the circulation, in consequence of disease elsewhere.
Local causes, confined to the uterus.

The constitutional condition which renders a woman liable to uterine hemorrhage may arise from prolonged lactation, malaria, or any other disease by which the blood is impoverished. Diseases of the heart, liver, or kidneys, by obstructing the general circulation, cause uterine hemorrhage, as does also chronic constipation, which impedes the return flow of venous blood from the pelvis into the portal system. Displacements, cellulitis, and growths in the pelvis, which have no direct connection with the uterus, may also obstruct the circulation mechanically, and produce uterine hemorrhage, but new growths connected directly with the uterus are the most frequent cause of menorrhagia.

As a rule, menorrhagia from constitutional causes is most commonly found in young women, while those who have borne children, and all who approach middle life, suffer generally from a local cause.

The development of fibrous growths of the uterus is, as stated before, the most common local cause of irregularity and increase of the menstrual flow, for all classes of women. But women who have borne children suffer from the effects of various local injuries, which afterwards play a most important part in disturbing menstruation and causing hemorrhage. Laceration of the cervix will be found to be the most frequent injury, as well as the most common cause of irregularity, both as to time and quantity. Displacements of the organ and growths within the uterine canal, such as fibrous polypi, growths from the mucous membrane, granulations, mucous polypi, and malignant disease, cause uterine hemorrhage. When a loss of blood continues after a miscarriage or childbirth, and the uterus has become sufficiently contracted to prevent post-partum hemorrhage proper, the flow may be considered as due to a portion of the placenta being retained, or to a lacerated cervix. With the first condition, the external hemorrhage is not continuous, but becomes more marked when the uterus expels the clot. It is not within my purview to enter at any greater length into a consideration of hemorrhage from this cause. Should the bleeding from the vagina be continuous, and if there has been any laceration externally, the probabilities are greater that the cervix has been deeply lacerated so as to involve the circular artery. I am not aware that any case has been placed on record where death has resulted directly from this injury, but it has entailed years of suffering which, I am satisfied, in many instances, might have been prevented. When this hemorrhage occurs, it will add but little to the danger of the patient to have her well wrapped up and lifted upon a proper table for examination immediately. If, on introducing the speculum, the bleeding is found to come from a laceration in the cervix, I believe that it would be good practice to close it. This can be done by the introduction of several interrupted silver sutures, and the parts may be brought together in less than ten minutes, if the operator has the slightest dexterity, for the surfaces are then soft, and already lie in contact. By thus arresting an oozing which may go on for days, the patient's strength will be spared, and the risk of blood-poisoning which will be present as long as these raw surfaces are bathed in the uterine discharges will be greatly lessened. If the laceration be left uncared for, involution will be at once arrested, and the woman will necessarily suffer from a displacement or sagging of the organ. As a consequence of laceration, menstruation will suffer much derangement, and the patient must eventually submit to an operation far more serious than it would have been at first.

There are certain rules which are applicable to the treatment of all forms of hemorrhage from the female organs of generation not dependent on the puerperal state. A quiet mind, rest in the horizontal position on a hard hair mattress, and a cool atmosphere are essential in the treatment for arresting hemorrhage, without reference to the cause or the local means to be employed.

Internal remedies can be but little relied upon to control hemorrhage without the aid of local means. Opium, however, in some form, and by enemata or rectal suppositories, should always be employed when necessary to quiet the circulation, or to allay pain. The combination of a small quantity of ipecac. with opium, as in Dover's powder, may take the place of the opium by the bowel when the skin is found dry and inactive. In the absence of pain or nervousness aconite may be used with stimulants to quiet the heart's action when the patient has suffered from loss of blood ; but nutritious agents, as beef-tea, must be freely employed at the same time. The acetate of lead and opium, alum, ergot, and other remedies, are sometimes used internally. The opium is as efficacious without the lead ; from alum I have never seen any effect when taken internally, except nausea ; while ergot can have little effect on the bloodvessels by exciting the uterus to contraction, unless the organ be enlarged. From five to fifteen grains of gallic acid dissolved in equal parts of pure water and cinnamon water, with a little syrup, may be given every two or three hours, according to circumstances. Cinnamon frequently seems to exert a marked influence on the circulation of the uterus, and makes a good combination with gallic acid. Only from this preparation and from opium have I seen any certainty of action, and even these are large injection, to be given while the patient is on the knees and chest, will thoroughly remove the obstruction. We occasionally see in practice young girls who menstruate very profusely, and for which no cause can be detected beyond a condition of general plethora. The treatment for these must consist in regulating the diet, directing more exercise, the Turkish bath, and the free use of saline purgatives between the periods. Very much the same mode of treatment is useful for women going through a change of life who are over-plethoric, and when the hemorrhagic tendency is not due to any recognized local condition. These cases are also benefited by a brisk mercurial purgative, taken a few days before each period, but long enough beforehand that its action may not have the effect of suppressing the flow.

It is of great importance that a woman should keep quiet at each menstrual period, long after the supposed cause of hemorrhage may have been removed, that the hemorrhagic habit may thus be overcome.

Dysmenorrhœa.—Every woman even in health will experience at least some degree of discomfort at the menstrual period. That she should be absolutely free from pain and suffer no inconvenience at this time is an abnormal condition. The degree of pain, however, varies not only as between individuals, but with the same person; great deviations from their usual habit may appear without being necessarily due to local disease.

The pain of menstruation bears, as a rule, some relation to the amount of flow, being great in proportion to the diminution in quantity, or to the degree of obstruction. This is the rule, but menstruation frequently becomes painful although the flow may have been already increased beyond the natural habit, and although no obstruction may exist to its free escape.

Pain is frequently caused simply from the increased flow of blood to the parts, as the current comes to be turned in that direction in consequence of the hemorrhage.

But painful menstruation, as a rule, may be considered due to constitutional causes, although sometimes only indirectly. When a woman is anæmic, her condition is favorable to neuralgia, which, instead of locating elsewhere, expresses itself in painful menstruation, when the organs of generation happen to be wanting in tone. Were it possible to subject a woman in perfect health, and another while anæmic, to exactly the same circumstances provocative of pain, it would be found that the latter, with her nervous system deranged, would suffer far more than the former.

The most common cause of painful menstruation has been thought to be the existence of some mechanical obstruction to the free escape of blood from the uterine canal. Flexures of the uterus, where the organ has become bent on itself so as to close the canal, and growths within the uterine tissue, which act in the same manner, may be cited as examples of mechanical obstruction. This view might be accepted without question, were it not that every observer has noticed instances where painful menstruation was not always an attendant on flexures or apparent obstruction to the canal. When a flexure is formed above the vaginal junction, there is always pain during the flow, and a state of obstruction does exist beyond question. But with a flexure at the vaginal junction, caused by the neck being too long and thin to remain straight in the vagina, the angle at which it is bent is always more acute than it is with a flexure in the uterine body. Notwithstanding this fact, and although the woman will probably be sterile, she does not necessarily suffer from painful menstruation. It should, therefore, be noted that flexure of the uterine body is a condition almost invariably accompanied by an impoverished state of the general health. But with flexure of the cervix at or below the vaginal junction, the general condition is rarely affected; and if so, it is not at all in consequence of an obstruction to the menstrual flow, but is due wholly to the effect of the sterility on the nervous system. It is by no means uncommon to find the womb nearly closed in consequence of the use of the nitrate of silver, and yet the condition seldom causes painful menstruation, although always sterility. I have observed several instances where the mucous membrane had become so contracted over the mouth of the canal, from the use of lunar caustic, that the orifice was too small to admit the finest probe. In these cases, I have seen the menstrual blood escape drop by drop from the small opening, but no pain was experienced except where the flow was sufficiently abundant to fill the canal before it could be emptied. The pain was caused by uterine contraction, the organ attempting to drive out a clot which had formed in consequence of the delay in the escape of the blood.

I feel satisfied from observation that, unless the flow is scanty, painful menstruation is accompanied by clots, and that their formation does not depend essentially on an obstruction. I hold this view from the fact that in several instances I have seen, by the aid of the speculum, one clot after another expelled from the uterus with pain, where the canal was not only straight, but also unusually large. Whatever the cause may be for painful menstruation, in flexures of the uterine body, it almost always exists in an aggravated form, and is never relieved by a surgical procedure alone. Occasionally, where the flexure has been in the uterine body, we do succeed, after an operation, in opening up the canal, so that an obstruction no longer exists, and yet, as has been said, the dysmenorrhœa is never permanently relieved by the operation alone. I can offer no explanation for this form of painful menstruation, except one based upon theoretical views; yet, the evidence is so strong, that I believe further observation will show that my deductions have been correctly drawn.

With our present knowledge the weight of evidence is in support of the view already given, that the whole lining membrane above the internal os is removed at each menstrual period. In a state of health this process of disintegration, we may assume, takes place with but little disturbance. But, on the other hand, if, from some abnormal condition, this process is retarded, nuclei may be furnished for the formation of clots, which increase in size until the uterus becomes excited to contraction in efforts to expel them. The pain thus caused is always intermittent, a character which goes to support the explanation just given. We thus have every degree of suffering, from a few pains at the beginning of the flow, before relief is obtained, to the form known as membranous dysmenorrhœa. In this condition the suffering is persistent until, by frequent contractions of the organ, the whole lining membrane of the canal, above the internal os, is thrown off in one mass. No obstruction exists in these cases to the free escape of blood; at least, in every instance which has passed under my observation, the uterine canal has been straight and the os sufficiently open.

It has been supposed that the formation of this false membrane, as it has been termed, is due to ovarian influence; but of this we have no proof beyond the frequent coexistence of pain over the region of one or both of these bodies. The throwing off of this coat from the uterine canal is a frequent accompaniment of an enlarged and prolapsed ovary, but it does not always take place with this condition; sometimes we are unable to detect the slightest disease in the ovaries.

It has also been supposed that this membrane is a product of inflammation, but of this we have no proof, while the weight of evidence rather points to the contrary.

Mr. Whitehead[1] has pointed out that the acid reaction of the vaginal secretions on the fibrin, prevents the menstrual blood from coagulating in the vagina, and it undoubtedly has this property. The opinion of this writer, and of others quoted by him, is to the effect that healthy menstrual blood is deficient in fibrin. This view was held by Dr. Carpenter, who, in his work on Physiology, says: "when clots are found in it, therefore, a morbid condition of the secreting surface must be inferred." Mr. Whitehead found the menstrual blood deficient in fibrin after it had been exposed to the vaginal secretions, but, when the blood was collected on its escape from the uterine canal, there was but little difference detected between it and blood obtained elsewhere. The question may be mooted as to cause and effect, but the fact will be recognized that, with all these menstrual disorders, the general health is impaired, and the blood is necessarily deficient in properties which would render it less likely to clot.

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[1] On the Causes and Treatment of Abortion and Sterility, by James Whitehead, F.R.C.S.

We must then accept the supposition, until proved by farther observation to be erroneous, that a poor condition of the general health retards the disintegration of the uterine lining membrane.

Although the menstrual flow comes on at its regular time, if this membrane is not in a condition to be readily washed away in débris, a nucleus will be furnished by it to retain the blood. The blood will be thus delayed in its escape from the canal long enough to form clot after clot, which will excite uterine contraction with pain, until all have been expelled.

An excessive amount of pelvic congestion during the menstrual period, either from increased fluxion to the parts, or from obstruction in the venous circulation, may, at the same time, produce pain in the uterus and ovaries. This would naturally be expected from the peculiar character of the vascular supply in the pelvis, and, should local disease exist in either ovary, the pain will be well marked in that neighborhood, but merely as an effect of the general pelvic disturbance. When the ovarian function is defective from some general cause, and the ovaries are no longer able to emit the ovarian influence, the uterus must necessarily feel the effect of its absence. But we have no positive evidence that a diseased condition of one ovary alone necessarily influences the uterine condition, and disease of the uterus certainly does not produce ovarian disturbance.

To recapitulate:—Whenever pain is felt in the uterus and ovaries at the same time, we may, as a rule, conclude that both are suffering from a common disturbance, and this is generally to be traced to an obstructed circulation. As this obstruction is increased by the additional flow of blood attending menstruation, a coincident pain may be produced in one or both ovaries, due to the presence of some local disease. From the marked character of the ovarian pain, it is often assumed that any uterine disease, which may exist at the time, is due to the ovarian condition, while the fact is, that both uterus and ovaries are but suffering from the effect of a common cause. A woman may suffer pain in the ovary at the menstrual period, although there may exist no uterine disease which can be detected. The natural additional flow to the pelvis attending the period will cause suffering if inflammation of the ovarian tissue has previously occurred, or if there are any adhesions which bind the ovary down enough to obstruct its circulation. The pain at this time is also often great, in consequence of the presence of cicatricial or dense tissue within.the ovary itself.

We have no means of recognizing ovarian diseases, unless the ovary becomes enlarged, which is comparatively rare, and on post-mortem examination the evidences of disease are very rare in comparison with the pathological changes found in the uterus itself.

Therefore, my convictions are, that ovarian disease has but little share, as compared with the uterus, in the pain of menstruation.

In the absence of any proof as to the connection between disease of tha ovary and membranous dysmenorrhœa, I am disposed to attribute the discharge of the membrane en masse to a want of general tone. It may be easy to substantiate the supposition that painful menstruation is sometimes due to a delay in the breaking down of the lining membrane of the uterus; but the causes which lie behind this delay and contribute to the casting off of this membrane en masse, must be sought in the general impairment of nutrition which always accompanies it. Healthy changes in tissue do not take place rapidly where the health is as much reduced as it uniformly is in all women who suffer from this form of painful menstruation, and, therefore, it is not improbable that the want of general tone may be the true cause of delay in this lining membrane undergoing the necessary fatty degeneration before disintegrating. An increase in thickness of the membrane may take place from perverted nutrition, as we often see unhealthy granulations of large size spring from surfaces in other parts of the body when the general condition is impaired. As the menstrual blood comes from the vessels below this thickened lining membrane, it necessarily becomes detached in one piece, and can be expelled from the cavity only by uterine contraction, which would be accompanied by severe expulsive pains.

When the uterus or ovaries become heavy from excessive congestion, or suffer from any other source of irritation, the impression made lating in the vagina, and it undoubtedly has this property. The opinion of this writer, and of others quoted by him, is to the effect that healthy menstrual blood is deficient in fibrin. This view was held by Dr. Carpenter, who, in his work on Physiology, says: "when clots are found in it, therefore, a morbid condition of the secreting surface must be inferred." Mr. Whitehead found the menstrual blood deficient in fibrin after it had been exposed to the vaginal secretions, but, when the blood was collected on its escape from the uterine canal, there was but little difference detected between it and blood obtained elsewhere. The question may be mooted as to cause and effect, but the fact will be recognized that, with all these menstrual disorders, the general health is impaired, and the blood is necessarily deficient in properties which would render it less likely to clot.

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An excessive amount of pelvic congestion during the menstrual period, either from increased fluxion to the parts, or from obstruction in the venous circulation, may, at the same time, produce pain in the uterus and ovaries. This would naturally be expected from the peculiar character of the vascular supply in the pelvis, and, should local disease exist in either ovary, the pain will be well marked in that neighborhood, but merely as an effect of the general pelvic disturbance. When the ovarian function is defective from some general cause, and the ovaries are no longer able to emit the ovarian influence, the uterus must necessarily feel the effect of its absence. But we have no positive evidence that a diseased condition of one ovary alone necessarily influences the uterine condition, and disease of the uterus certainly does not produce ovarian disturbance.

To recapitulate:—Whenever pain is felt in the uterus and ovaries at the same time, we may, as a rule, conclude that both are suffering from a common disturbance, and this is generally to be traced to an obstructed circulation. As this obstruction is increased by the additional flow of blood attending menstruation, a coincident pain may be produced in one or both ovaries, due to the presence of some local disease. From the marked character of the ovarian pain, it is often assumed that any uterine disease, which may exist at the time, is due to the ovarian condition, while the fact is, that both uterus and ovaries are but suffering from the effect of a common cause. A woman may suffer pain in the ovary at the menstrual period, although there may exist no uterine disease which can be detected. The natural additional flow to the pelvis attending the period will cause suffering if inflammation of the ovarian tissue has previously occurred, or if there are any adhesions which bind the ovary down enough to obstruct its circulation. The pain at this time is also often great, in consequence of the presence of cicatricial or dense tissue within.the ovary itself.

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When the uterus or ovaries become heavy from excessive congestion, or suffer from any other source of irritation, the impression made on the extremities of the spinal nerves is at once transmitted to their seat of origin along the posterior portion of the spinal cord. Over the spine will be experienced a reflexion of the pelvic irritation. This will vary in degree, from the back-breaking pain which accompanies scanty menstruation, to the marked sensitiveness on pressure at some special point, which, in connection with uterine or ovarian disease, is always more marked when the woman is anæmic. It has already been described how the disorders of menstruation may cause disturbances elsewhere, through the medium of the sympathetic nerves. These disturbances are recognized by various forms of backache, headache, irregular action of the heart, nausea, diarrhœa, increased action of the kidneys, cold feet, chilly sensations in various parts of the body, and by different forms of hysteria. It would be of little practical value to consider the subject of reflex irritation at great length, and to do justice to the subject would occupy more space than its relative importance warrants. In a general manner, however, the subject will again be referred to under the head of treatment for hysteria.

Treatment of Dysmenorrhœa.—The first step should be to determine the cause of the painful menstruation, since the proper course of treatment must be directed by this knowledge. As different conditions may produce the same symptoms, as regards pain, a physical examination is often absolutely necessary. A conscientious man will seek to spare the feelings of a young girl from going through such an ordeal, but it is often a difficult matter in the discharge of duty to decide when it can be avoided. Where the flow is scanty, painful, and probably irregular, an examination may be delayed, provided the difficulty occurs in early menstrual life, and the cause may be reasonably attributed to over-taxing the nervous system by study. We may then watch the effect of an entire suspension of brain-work, and carefully look to improving the general condition.

I was latterly consulted by a lady of this city in regard to her daughter's condition. She had been menstruating regularly for two years; for six months after the first menstruation she had experienced little pain or inconvenience, but gradually the menstrual flow had become more painful, and at the last period she had suffered so much that it had been accompanied by hysterical convulsions. I learned that she had been growing so rapidly that it was difficult to keep her skirts of the proper length. She was tall for her age, but at first glance seemed to have been well nourished, and had a bright color. On examining, however, the condition of her heart I detected a well-marked anæmic murmur. She had been studying very hard at home for a year with private masters. I gained the key to the situation when I learned that she had been in the habit of devoting five hours daily to her Latin, in addition to her other studies. I felt that there was no necessity of seeking for a local cause under the circumstances. I insisted that all her studies should be discontinued; her general condition was looked after, and, as the weather was mild, she was directed to spend the greater part of each day at the Central Park, in the open air. There was a great improvement at the next period, and by the end of four months she reported herself perfectly well, as the last period had been passed without the slightest discomfort.

But, whenever the pain lasts throughout the period, with either an increase or diminution in quantity of the flow, or comes on after it has ceased, and if there is any pain or fatigue from standing or walking, the examination must be made. Under these circumstances, the physician will not discharge his duty if he neglects making it, or does not have it made by some one else if he has not himself had the necessary experience. The investigation is particularly called for when the occurrence or cause of pain can be traced to a fall or injury, or to a checking of the menstrual flow. If neglected, a condition, as the result of a displacement, or of disturbance in the circulation, will become established as a habit, which may only terminate with the life of the invalid. There exists sometimes a form of retroversion, having its beginning at puberty, and to be referred to hereafter, which must be corrected at an early age, or a retroflexion in after life will be the consequence. The examination of young girls may often be made by the rectum instead of by the vagina, for it is thus possible to judge of a displacement, the occurrence of an existing or previous cellulitis, and of the condition of the ovaries, should they be enlarged. It is of the utmost importance to determine if either of these conditions exists, when menstruation is painful, and we should, therefore, at least make the rectal examination. If, after this, it should be deemed necessary to make an examination by the vagina, it is better to give ether. We will thus spare a sensitive young girl much pain, both mental and physical, and the relaxing effect of the ether will render a thorough investigation far easier and will allow the parts to be dilated sufficiently for applying the subsequent treatment if any be necessary.

This subject might have been treated of under the head of "mode of examination." But, as I wished to avoid repetition, and to impress the importance of gaining an accurate knowledge of the condi-

[illegible] Nature [illegible]

[illegible] suffers from any [illegible] disease, it is [illegible] proper treatment [illegible]. A certain amount of physical pain [illegible], but if a young girl suffers the slightest injury [illegible] modesty or moral condition by an examination or by [illegible] treatment afterwards, the injury will come from the [illegible] reason.

Dysmenorrhœa is rarely a consequence of any condition which can be removed without subjecting the patient to a systematic course of treatment, so that certain palliative means will have to be resorted to, from time to time, until the cause has been removed. For the local treatment of dysmenorrhœa, as a symptom only, the reader is referred to the different conditions causing it. These are to be found under the head of flexures, uterine growths, lacerations of the cervix, inflammation of the pelvic tissues, and its consequences, displacements of the uterus, and the various conditions of the nervous system closely connected with faulty nutrition.

We have stated the rule that suppressed or a scanty menstrual flow is a condition generally accompanied by pain. When we are called upon to relieve a woman suffering with this condition of the flow, it is all-important that we should have a knowledge as to the cause. We shall not consider here causes which are mechanical, as they are to be treated of hereafter, a faulty condition of the circulation, for example, is one of them.

The veins of the pelvic organs may be so charged with blood as to cause the flow to cease or to be scanty and painful; and the same may be said of arterial fulness although it stops short of actual inflammation. From deficient ovarian action amenorrhœa or a scanty and painful flow may be found, with or without pelvic congestion.

We will be consulted, at the time of menstruation, only for the relief of one of these three conditions. Then the question will arise as to the proper mode of increasing the flow in quantity, and as to securing its prompt escape from the canal so that it may not form a clot to excite the organ to painful contraction for its expulsion.

The first condition cited, viz., that of venous congestion, is but an increase in degree of the state described as accompanying all uterine diseases of long standing. It is one where the vessels, having already lost their tone from impaired nutrition, become distended, almost to a state of stagnation, in consequence of the increased flow of blood to the pelvis at the time of the menstrual period.

The first effort must be directed to lessening the amount of blood in the pelvis, and to distributing it to the skin and extremities. When the suffering is very great, with a scanty flow, I often administer an emetic of ipecac., and cover the woman up warm in bed. As soon as the stomach becomes settled, the feet are to be put into a deep foot-bath of hot water and mustard. The bath should be administered as the patient lies in bed, and with as little exposure as possible. This can be done by placing something under the tub so as to elevate its edge nearly to the same level with the bed. Care must be taken to arrange the bedclothes so that they cannot become wet, and an extra blanket should be spread over the patient's limbs and the tub. Fresh quantities of hot water should be added from time to time, so as to keep the temperature elevated to as high a point as can be borne. It is better that the feet should be retained in the bath until the skin has begun to act, when it is probable the first relief will be experienced by the patient. That the action may not be checked, the patient should lift her feet from the water as the tub is withdrawn from under the blanket, without exposure. Then the limbs must be quickly wrapped in the blanket which has covered them, and without drying the feet. To increase the action of the skin, some hot drink should be administered. Nothing is better than a cup of tea made by pouring hot water on a little essence of Jamaica ginger, to which may be added milk and sugar to make it more palatable. The main object, however, is the hot drink, and anything else in the form of a tea will answer. I employ the ginger on account of its being a mild stimulant, and because it answers well to settle the stomach after the emetic. A stimulant is [illegible] an inflammation about the uterus, or a condition very [illegible] inflammation. In the condition of venous fulness [illegible] having been accustomed to a passive state of engorgement, [illegible] as the veins are chiefly implicated, there exists but little [illegible] inflammation.

When called to a woman who has checked her menstrual flow, by getting her feet wet or otherwise, the hot foot-bath must be used at once, and some stimulating hot drink given to bring on a reaction. [illegible] relieved, both in cessation of pain and a restoration of the flow, [illegible] best to apply a dozen leeches about the anus, and a hot poultice of ground flaxseed over the abdomen, and to administer ten grains of Dover's powder with five grains of quinine, the dose to be repeated when needed. Notwithstanding every care, the time of the period may be passed without our having succeeded in fully restoring the proper condition, and it will then be necessary to adopt some course of treatment for relief before the expiration of the new month.

Generally patients to whom we are called under the circumstances, as described, are said to have been in good health previous to the menstrual check, although I am inclined to accept the check as an evidence of defect somewhere. Yet, there seldom exists sufficient debility to contra-indicate active treatment, and the congestive disturbance should be broken up before it becomes a habit. The temperature in this condition, when taken in the vagina, is generally about half a degree higher than it is in the axilla. Should no greater difference exist, it is good practice to apply a blister over the lower portion of the abdomen, the size of which is to be regulated by the urgency of the symptoms. After the blistered surface has healed, if any tenderness in the vagina can be detected by the aid of the index finger, the patient must be kept quiet in bed, with a poultice over the abdomen, and the leeches should be again applied about the anus. This location is preferable to the neck of the uterus for leeching, since the pelvic circulation can thereby be as well influenced; and leeches cannot be applied in the vagina of a young woman without inflicting great pain and annoyance, besides entailing the risk of too great a loss of blood. But the chief object in selecting some other position than the neck of the uterus is, to avoid adding any further source of irritation to this organ, already over-congested; an increased flow of blood always takes place for a time at least to the neighborhood of leech-bites. The hot water vaginal injections should be used at night and in the morning, and iodine freely applied to the vagina and posterior cul-de-sac every four or five days. Should there have been no become red in from ten to twenty minutes, and the plaster should not be allowed to remain longer, even if the patient should not complain of the pain produced by it. It would be better to reapply it in an hour or two than to blister the surface, as this would cause unnecessary suffering afterwards. If the flow has come on, and the object is only to relieve the backache, and to quiet nervousness, a little mustard can be mixed with ground flaxseed into a poultice, so that it may remain with safety for a longer time. To aid in bringing on the flow, I have thought dry cupping to be sometimes more efficacious, provided the cups can be applied early enough. They are to be placed on each side of the spinal processes, and only in the immediate neighborhood of any point which may be found unusually tender on pressure. I prefer to use four or six large tumblers, since the relief is more prompt than would be the case were the same space covered with the ordinary-sized cupping-glasses. Unless the tumblers are unusually heavy and thick, there will be no difficulty in making them hold on after properly exhausting the air by igniting a little alcohol which has been poured directly into the glass or upon some cotton or a piece of paper stuck to its bottom. As I am not writing for the benefit of experts alone, the frequent reference thus to details, which may seem to be trivial in character, must be overlooked by those who may not need them. Therefore, I will add that the counter-irritation should not be unnecessarily increased by burning the patient, from either letting the ignited cotton fall upon the skin before the tumbler reaches it, or by over-heating the glass before it is applied. The first can be avoided by pressing the damp cotton firmly against the bottom of the glass before dropping on the alcohol; the second by wiping off with a cloth any excess of alcohol which may have run down to the edge of the glass, and by applying the latter to the surface immediately after igniting the alcohol. From fifteen to twenty minutes is long enough for the cups to remain in one place, after which they may, with advantage, be shifted to another.

For this form of painful menstruation—viz., that from venous fulness—the same routine in treatment may be necessary month after month, until the local disease has yielded to treatment. During the interval between the periods, the general condition must be carefully looked after, the bowels regulated, and the skin well protected by flannel. A Turkish bath is often beneficial in its effects when taken within a week before the expected period.

From arterial congestion, the pelvic vessels may be so over-distended as to bring about an absolute suspension of the menstrual flow; and there may be an inflammation about the uterus, or a condition very closely allied to inflammation. In the condition of venous fulness the organs have long been accustomed to a passive state of engorgement, but, as the veins are chiefly implicated, there exists but little tendency to inflammation.

When called to a woman who has checked her menstrual flow, by getting her feet wet or otherwise, the hot foot-bath must be used at once, and some stimulating hot drink given to bring on a reaction. If not relieved, both in cessation of pain and a restoration of the flow, it is best to apply a dozen leeches about the anus, and a hot poultice of ground flaxseed over the abdomen, and to administer ten grains of Dover's powder with five grains of quinine, the dose to be repeated when needed. Notwithstanding every care, the time of the period may be passed without our having succeeded in fully restoring the proper condition, and it will then be necessary to adopt some course of treatment for relief before the expiration of the new month.

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The third condition mentioned as causing abnormal changes in menstruation is deficient ovarian action. If there has not been an arrest of development of the ovaries, amenorrhœa or a scanty flow may be established without any notable change for a time in the size of the uterus. The menstrual flow becomes less or ceases ; not in consequence of failure in the ovaries to mature an ovum at the time of that special menstrual period, but it takes place gradually, ovulation having been imperfectly performed for some time previous, and without the proper amount of stimulus to emit the needed ovarian influence. Until atrophy of the ovaries has been produced, a periodical flow of blood to the pelvis will continue to take place, in a greater or less degree, as a result of habit, and the woman will suffer with intense backache from the increased weight of the uterus, and from ovarian pain, also a result of the congestion.

Atrophy is often but an evidence of an advanced stage of the second condition, viz.; that of arterial congestion, the deviation of which varies much in different cases. At a later period, as the general health becomes impaired, but before atrophy of the uterus has come on, the pelvic veins lose their tone, and the local condition approximates closely to the one described as attending all uterine disease of long standing. As an attendant on scanty and painful menstruation, due to imperfect ovulation, the nervous manifestations are all more marked by some form of hysteria than in the first condition where the ovaries perform their function, or in the second form which is due to arterial congestion.

As long as the uterus remains of normal size, there will be a reasonable prospect for final restoration, by which the flow may become fully established in quantity, and the pain relieved. My chief reliance for the relief of this condition has been upon general treatment and the use of sponge tents just before the expected time of the menstrual period. I have generally found that the dysmenorrhœa is relieved in proportion to the increase of the discharge. To bring this about, I have employed one or two tents before the time for the flow, or I have made an application of iodine, impure carbolic acid, or dilute chromic acid to the fundus, and formerly, I have even passed up a portion of the solid nitrate of silver, and left it in the canal; all with the view of bringing on a discharge of blood. The nitrate of silver I would not recommend, even if it were more efficient, for fear of its after effects on the os. To the use of the chromic acid somewhat of the same objection exists, although to a much less degree, but it is an agent never to be employed if there is still to be detected any evidence of the products of a former cellulitis. Under the same circumstances. the use of sponge tents would be equally inadmissible. As long as any tenderness on pressure can be detected by the aid of the finger, our local means must be limited chiefly to the use of Churchill's iodine. This injunction is only applicable to a previous existence of cellulitis, but, as I have stated, it is important that this condition should not be mistaken for the extreme reflex sensitiveness accompanying impaired nutrition. If we are able to distinguish the latter condition, there would be no danger in the use of tents; but a few applications of iodine followed by glycerine dressings may be of service for diminishing the sensitiveness before the tents are used. The iodine is to be applied with the applicator, bent to the exact course of the canal after this has been ascertained by careful use of the probe. To obtain its full benefit the cotton saturated with the iodine must be left behind in the canal until thrown out by the uterus. As soon as sponge tents can be used with safety, they should be resorted to as the most efficient means for bringing on the flow and for increasing its quantity.

The membranous form of dysmenorrhœa is to be treated locally in the same manner, and by the use of sponge-tents previous to the expected period, whenever they can be borne.

As I have already stated, I believe the condition of scanty and painful menstruation (the uterus being of normal size) and the membranous form of dysmenorrhœa, to be but different degrees of the same state of general impairment by which the normal changes in the uterine membrane are retarded. By pressure of the sponge tent, or by a stimulating application to the uterine canal, before the expected period, we hasten the disintegration of its lining membrane, so that its condition is made to approach nearer to one of health at the time when the flow comes on. It may be necessary to employ some form of anodyne to allay irritability when using the tents, but remedies of this class must be used with great care, to avoid creating the habit, and on account of their effect on the digestion. Under all circumstances, the permanent gain will be in proportion to any improvement we may be able to bring about in the general condition. Frequently the uterus is so irritable that the use of hot-water injections, with the free application of iodine to the vaginal walls, and a careful general treatment will be necessary before an attempt can be made to introduce the tents. Sometimes the patient is so run down, and in so irritable a condition, that nothing can be accomplished without an entire change of climate, and the alterative influence of a sea voyage.

For some time after the uterus has passed into a state of atrophy, a woman will often continue to suffer from backache, as has been stated, at the time when the flow should make its appearance. I have but little faith in the use of local means for the relief of this condition, and there is a limit even within which any improvement in the general health will benefit the local condition.

Electricity has apparently been beneficial sometimes in bringing on the flow and in relieving the pain caused by the suppression. But its application has been empirical in my hands; under apparently similar circumstances, the interrupted current has seemed sometimes to answer, when the constant one had no effect, and vice versa, in turn both currents would fail. Electricity in any form has usually a tonic influence, acting apparently on the general system, with very little local effect, at least in diseases of women. Beyond this my experience does not warrant a more decided statement as to the best mode by which it should be used.

Case I.—About two years and a half ago, I was consulted in reference to the condition of a young lady in this city, with the following history: During childhood she had been, as it was termed, rather delicate, but always free from any special difficulty. She was remarkably quick and intelligent as a child, with a great fondness for study. She began menstrual life at fourteen years of age, apparently under auspicious circumstances; the flow lasted three days and was free from pain. But, as a consequence of over-study, I have every reason to believe, the menstrual flow became scanty, painful, and irregular, and the ovaries and uterus had become blighted before she had reached the age of fifteen. For nearly three years she had been travelling about, with great improvement to her general health. But there had been no return of the menstrual flow, except when it so happened that the period was passed at sea. Yet she had frequently suffered, at other times on land, when the flow should have come on, from a dragging feeling in the back, and one of fulness about the pelvis. She was eighteen years and a half old when I first saw her, and her uterus was only two inches deep. I could discover no special condition likely to be benefited by local treatment, so requested Dr. Rockwell to take charge of her, and try the effect of electricity. No direct application was made to the uterus, but the current was formed by placing one electrode over the lumbar region or sacrum, and the other on the lower portion of the abdomen. This treatment was continued for some five months, three times a week, I believe, until June 28, 1875, when she menstruated naturally for two days. I made an examination shortly afterwards, and found that the uterus had acquired a normal size. The treatment by electricity was shortly afterwards modified as to frequency, but was still administered sufficiently often to keep up the normal size of the uterus. But I believe, there was only one natural effort at menstruation afterwards, since which she has never menstruated except while at sea. In the mean time, it had been so arranged that she should sail a day or two before a menstrual period, and return home at the end of one month, so that she should pass two consecutive periods at sea. This has been done three times, and in each instance the flow has come on naturally, with but little pain, and has lasted two or three days, but there has been no show at home. She remains in very fair general health, but at times is listless and unable to interest herself in any subject without making an effort. Her general appearance is that of a girl of sixteen, and she has a vagina so small that I would have been reluctant to make an attempt to introduce a sponge tent, even if the necessity for one had been imperative. As she herself has wished this mode of treatment deferred, it has not been urged, and the case is cited chiefly to show the effects of a sea-voyage in such cases; and this one is not unique, since I have known of several other like instances. Among emigrants, however, a contrary effect is produced by the sea-voyage, amenorrhœa being a common condition for several months after their arrival. In the first case, nutrition being at fault, the impression produced by the sea air and motion is beneficial; but with the emigrant, who is generally in good health, the nervous system is fully occupied, from the first, in counteracting the deleterious effects arising from anxiety of mind, a new mode of life, and the privations to which emigrants are too often subjected.

VICARIOUS MENSTRUATION.

As habit plays so important a part in organic life, it may be reasonably supposed that its influence would determine a flow of blood to the pelvis at regular intervals, corresponding with what are or should be the menstrual periods. Yet, there must be a limit to this influence, and there is no reason to doubt that as long as the uterus remains of a normal size, the regular flow is in the main due to ovarian excitement. When the uterus remains of a natural size, and the menstrual flow does not take place at the regular period, we must suppose that the fault lies in the uterus itself. With our present limited knowledge, we must confess our ignorance as to the cause of menstrual regularity, and can only refer to the supposition, already advanced, that the escape of blood cannot take place until the uterine lining membrane has undergone the change which is known to accompany each period. If this were proved true we would still have to seek an explanation as to why sometimes this change does not take place or is delayed; and we can only conceive that the defect is due to faulty nutrition. When the vessels of the pelvis become over-charged with blood, they are prone to rupture, and if no ready outlet existed for the escape of the blood it may accumulate in masses, as in hæmatoceles. Should, however, no rupture take place, a sufficient amount of local irritation may be produced which leads to a general disturbance of the circulation. Congestion of other parts of the body follows as a result, and rupture of capillaries may ensue in any organ, which, if it happens at the proper time for the menstrual flow, replaces this, and is termed vicarious menstruation.

An unnatural escape of blood may thus take place from the mucous membrane of any portion of the body, or the pressure on the circulation may be relieved by an unusual increase of the natural secretion from some organ. But we are ignorant of the law by which the selection is regulated, so that bleeding of the nose, or hemorrhage from the stomach or lungs may take place with some individuals, while with others there will be a profuse serous diarrhœa. The occurrence of diarrhœa at this time is common, and the escape of blood from hemorrhoids equally so with some women, who suffer from a scanty menstrual flow; and the explanation is a simple one when we consider the connection between the pelvic circulation and that of the mesentery.

During the temporary suppression of the menstrual flow, from any cause, the occurrence of diarrhœa is often observed at the time when the flow of blood should take place. An increase of leucorrhœal discharge from the vagina is equally common, and is easily understood to be an effort of nature to relieve the pelvic congestion. But why the brain or vessels of the spinal column should sometimes bear the brunt of the disturbance, or why a periodical hemorrhage should occur from the stomach, with no evidence of local disease, cannot be so readily explained.

The treatment of vicarious menstruation must depend, in a general way, on circumstances. But our chief efforts must be directed to correcting the local condition, that the current may, as soon as possible, be turned into the natural channel, before the serious complication of a bad habit becomes fully established.

HYSTERIA.

The various nervous manifestations which are grouped together under the term Hysteria are all, as a rule, intimately associated with some menstrual disorder. These nervous manifestations are generally found in the unmarried and sterile, and at puberty, before the system has become impressed with the menstrual habit. They also occur with the state of amenorrhœa or suppression, scanty and painful menstruation, and at the change of life. These conditions are associated, more or less, with a general impaired nutrition and defective ovarian influence. Hysteria is supposed by many to be caused directly by ovarian irritation, but while granting that hysteria and ovarian disorders generally do coexist, I am not disposed to admit a necessary relation between them of cause and effect. Ovarian irritation, or defective action of the ovaries, and the different nervous manifestations all spring from defective action in the nerve centres, the result of faulty nutrition.

This subject, as to supposed cause and effect, together with the general treatment, has already been considered. It is only necessary to state, in addition, that after a shock or morbid impression has been once made on the nerve centres, it requires but a slight exciting cause to bring on, at any time, these nervous manifestations. Hysteria, therefore, may be associated with any or all of the uterine or ovarian disturbances, having, as we have seen, the same cause, viz., defective nerve force; and any local lesion or disorder may, by reacting on a susceptible nervous system, excite, at any time, the nervous manifestations. The treatment of hysteria consequently can be only palliative; we must combat its symptoms as they arise, from whatever provocation, without neglecting measures to restore the general and local condition to a normal standard. To cut short an attack of hysteria, it is necessary to make upon the patient a powerful moral impression of fear, or indignation, since all arguments addressed to her reason will be futile. The dashing of cold water into the face, or the pouring of it over the head, and continuing to do so until the patient makes an effort to control herself, will promptly cut short an hysterical fit, if employed in the beginning of an attack. Yet I now seldom resort to it; for the value of the treatment lies in the low temperature of the water and in its liberal use, it is therefore almost impossible to protect the patient from the consequences of exposure from wet clothing and saturated bedding.

The usual treatment is to inject into the rectum the greater portion of the contents of a basin of hot water to which has been added an ounce of the tincture of assafœtida. Experience has taught us that a threatened attack of hysteria may often be aborted, or, if already present, may be greatly mitigated by getting rid of the flatus which is so suddenly generated in the large intestines. This flatulent condition is the result of a reflex irritation from the sexual organs to the intestinal tract, between which the nerve connections are of the most intimate character. Between two paroxysms, the patient will generally be lying exhausted, with her head near the edge of the bed, and apparently unconscious. I seize this opportunity to prepare the assafœtida, stirring it up thoroughly with the hot water in close proximity to her nose. As she shifts her position to avoid it, the basin must be moved accordingly, until vomiting is induced, or until a protest is called forth against the indignity offered her. I then propose a compromise, to remove the cause of offence if she will make the effort to control herself; but on the slightest evidence that an attack is about to come on, the mixture is held to her nose until the threatened paroxysm subsides, even if she has to inhale the odor for hours. I then have her placed on the left side near the edge of the bed, with her lower limbs flexed, as if for the purpose of having the speculum introduced, and the injection is administered. It is advisable to fill the whole colon, that the bowels may be thoroughly moved, and the flatus all absorbed by the water, or passed off. By placing the patient in this position, a much larger portion of the injection can be introduced than in any other way, before she will feel any inconvenience. The injection must be thrown in slowly, and when, apparently, the patient is unable to retain more, a kind word of encouragement will aid her in resisting the effort of expulsion. The nozzle of the syringe must then be withdrawn, and firm pressure be made over the anus by the palm of the hand against a napkin rolled up and placed between the limbs. Pressure thus properly made will aid the patient in resisting the desire to evacuate the bowels, which should be delayed as long as possible. As the patient will be much exhausted, the bowels should be evacuated on a bed-pan, since the exertion of getting up might bring on another attack, notwithstanding her efforts to resist it. By the time the colon has been emptied, the skin will be acting well, and the patient, although, thoroughly tired out, will feel relieved. The action of the skin should be kept up by extra bedclothing, and the patient allowed to sleep. When the physician is called early enough, he may sometimes prevent a threatened attack by placing a mustard plaster along the whole length of the spine, and giving a dose or two of the valerianate of ammonia and some good advice addressed to her self-esteem. But the attack may have advanced so far that the patient is no longer able to make any exertion, and it may be necessary to apply the mustard to the spine and inside of the thighs, before the injection can be administered. Sometimes the convulsions are so severe or frequent, that it becomes necessary to administer an anæsthetic to enable the hot water and assafœtida to be thrown into the rectum; the mustard also may then be applied.

When the colon is distended by the hot water, the reflex irritation is always relieved with more promptness than if the water is thrown into the vagina. The assafœtida has also a soothing effect, and with the hot water excites the muscular fibres to contract with more tone, and to resist afterwards, for a time, a reaccumulation of the flatus.

It is possible that the hysterical attacks are caused directly by the same irritation which induces the rapid accumulation of flatus; but most often the attacks are due to the distension; for the severity of the paroxysms is always in proportion to its degree, while their occurrence can be controlled by insuring a free escape of flatus; and they subside as soon as the colon has been thoroughly emptied.

It was formerly my practice to have a rectal tube introduced by the nurse as soon as an attack was threatened, and I have often witnessed an effect from it as striking as that which follows the opening of the trachea to arrest epileptic convulsions. When the rectum happens to be free from feces, on introducing a large flexible tube to or beyond the sigmoid flexure, I am often amused at the suddenness with which the patient's preparations for an attack cease. As soon as she gets herself in position for an attack, and tightens the abdominal muscles, a free escape of flatus takes place from the tube without the slightest warning, and the effect is that she lies quiet, fearing to move, and her face, if she is conscious, expresses no little surprise.

Several years ago I was present on such an occasion, in my private hospital, where a young lady had been lying in apparently an unconscious state, after an hysterical convulsion, and had taken no notice of my presence, although I felt satisfied that she was aware of it. The nurse had just introduced the rectal tube as I entered the room, and the patient began an attack shortly afterwards for my benefit. She suddenly threw herself in a position of opisthotonos, but before her head and feet could be brought under her, a loud escape of flatus took place from the tube, and continued with a steady but lowering note for several seconds, as she gradually straightened herself out, and the colon became empty. I was in a position to see her as she opened her eyes, and the appearance of astonishment and mortification depicted on her face, as the flatus continued to escape, was intense. I quietly asked if she had lost all the delicacy of her sex, in making such an exhibition before me, when she burst into tears and covered her face. She had, before coming under my care, been very wilful, and had had these attacks of hysteria frequently, often tearing the bedclothing and her nightgown. But they were never repeated, as she was assured by the nurse that the instrument would again be introduced if she showed any symptoms of another seizure, and after that she would have to continue wearing it, so that the wind might escape all the time. Through this fear, she began to exercise her self-control, and the impression thus made on her mind was the turning point in her case towards recovery.

CHAPTER XI.

CONGENITAL ABSENCE AND ACCIDENTAL ATRESIA OF THE VAGINA; MODE OF OPERATING FOR ESTABLISHING THE CANAL, AND FOR EVACUATING RETAINED MENSTRUAL BLOOD.

Causes of retention—Mode of relief—Table XIII., exhibiting cases of imperforate hymen, congenital absence of uterus, and accidental occlusion—Cause of death when the uterus has been emptied of its contents—Proper mode of treatment—Cases.

The retention of menstrual blood within the uterine cavity results from congenital or accidental causes.

Causes of retention,	Congenital,	Absence of the vagina,
		Imperforate hymen.
	Accidental,	Closure of the os uteri,
		" " " vagina.

A young girl may reach and pass the average age for puberty, apparently in full physical development, and yet without any appearance of the menstrual flow. The history given will be to the effect that a year or two previous to seeking advice all the rational signs of approaching menstruation had been recognized. Month after month these symptoms presented themselves with evident periodicity, but without a show, and, at length, the backache and sense of pressure on the bladder and rectum had become constant, or there may have been little inconvenience from pressure on the bladder or rectum, but a marked nervous disturbance. Recently, however, these symptoms may not have presented themselves with as much regularity, but the nervous disturbance will be great and her general health may have already begun to suffer, and in all probability some symptoms of blood poisoning will be detected at the first examination.

It is of the greatest importance to investigate the condition of a young girl presenting these symptoms, without delaying until her general health begins to suffer. The chief point to be established by an examination is whether or not there exists retention of the menstrual blood, for without this knowledge we cannot be sure of the proper course of treatment. The retention should be recognized at as early a day as possible, for the best results are obtained from early operative interference before the uterus has been greatly distended. With congenital absence of the vagina, an early operation is imperative if an accumulation has taken place. Nature guards against rupture of the uterine wall by an increase in its thickness, as during pregnancy; the original parietes of the organ are not made thinner by the distension. As a result of delay, the patient becomes exposed to two dangers: dilatation of the Fallopian tubes, it is said, may occur by their becoming filled with the contents of the uterus, and they may either rupture or allow of the escape of the fluid into the peritoneal cavity. The second and chief danger is from blood poisoning. There is also a risk of inflammation, in consequence of the blood being forced through the tissues of the uterus without actual rupture. Dr. Barnes,[1] after referring to some experiments by Dr. Mathews Duncan, showing that under hydraulic pressure, air and liquids penetrate the uterine wall, writes: "But it appears to me that there is good reason to believe that the force which the living uterus exerts in its efforts to expel what may be in it, whether it be a fœtus or imprisoned fluids, is enough to drive fluid through its walls, in the form of a fine oozing, or dew, which hangs on the peritoneum. It seems to me probable that it is in this way that some cases of puerperal pelvic peritonitis are produced; and I have seen cases of septicæmia and peritonitis occurring from retention of menstrual fluid, greatly resembling puerperal fever, in which there was no rupture, and no escape of fluid by the open ends of the Fallopian tubes."

If the vagina is absent, it is proper to open a canal at an early age, even if no retention exists, or if a vestige of the uterus can be detected. A case will be cited to show that nature had evidently delayed the development of puberty in consequence of an occlusion, although this is not the rule. Another instance will be given in which the uterus became developed, after failure of the operation to disclose any trace of the organ. In two other instances, the health became established after the operation, although no development of the uterus took place afterwards; this remarkable circumstance has been noticed by Dr. Barnes also.

For the examination, the patient must be placed on her back, with her limbs flexed, and her body within easy reach of the operator. By passing the index finger into the rectum, it will be easy to satisfy one's self from the size of the uterus, if developed, as to the probability of there being fluid retained within its cavity. This, however, we must not assume, without further examination, if the vagina be developed, since pregnancy is known to occur occasionally before the appearence of menstruation. Should the uterus be felt to be in position, and of nearly a normal size, it will not be necessary to extend the examination beyond separating the labia for the passage of a probe to a sufficient depth to ascertain that the vagina is pervious. Under these circumstances we may assume that the delay in the appearance of the menses is due to some fault in the general system, which we must first make an effort to relieve.

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[1] A Clinical History of the Medical and Surgical Diseases of Women, by Robt. Barnes, M.D., p. 181.

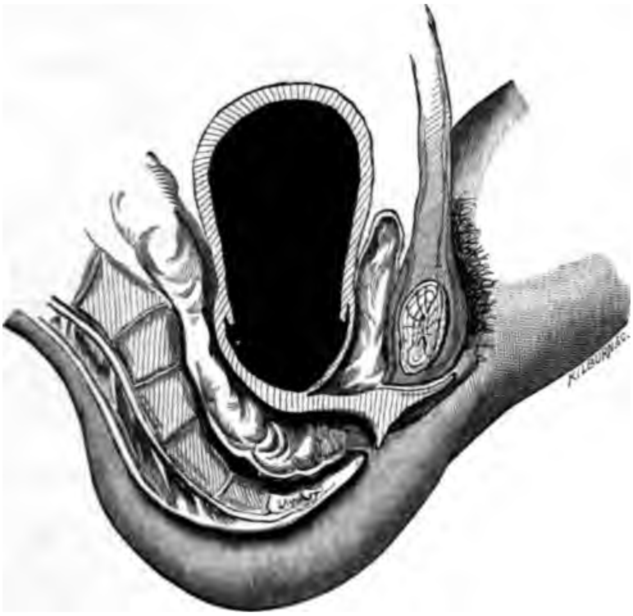
We shall be readily able, as a rule, to distinguish the absence or a defect of the uterus from a want of development as to size only. At a point somewhat lower than that usually occupied by the cervix and vaginal junction, the finger will come in contact with a well-defined crescentic ridge, or band, extending across the pelvis in a direction from one ovary to the other. The sensation conveyed to the finger will be that of a sagging of the broad ligament or other structure in the space which would be occupied by the uterus if it were present. After introducing a steel sound into the bladder, the extremity of the instrument can be easily brought in contact, along this crescentic band, with the finger in the rectum, which could not be done were the uterus in position.

According to Kussmaul and others it rarely, if ever, happens that the uterus is entirely wanting, and they hold that a post-mortem examination will always reveal some vestige or rudimentary portion of it. The correctness of this statement I cannot verify or disprove by post-mortem observation, but I have seen six cases or more of congenital absence of the vagina where, after the most careful investigation, it was impossible to detect the slightest trace of the uterus.

When the accumulation is confined to the uterine cavity, it will be felt from the rectum, as an elastic mass nearly globular in shape. But the most common form met with is the one shown in Fig. 41, where a portion of what is a recto-vesical septum is also distended. No portion of the vaginal canal is open, but the tissue which presents at the os is crowded off when this becomes dilated, and put on the stretch as the fluid continues to accumulate. It is sometimes stated by writers, that the uterine cavity does not become dilated when the accumulation is caused by an imperforate hymen. The correctness of this statement depends upon the extent of the accumulation, since if there should be no other outlet the uterus must become dilated by the backing up of the fluid as soon as the vagina becomes over-distended.

With young girls who have never had a menstrual show, the obstruction is usually a congenital one, due to a want of development of the vaginal canal, in whole or in part; or the retention may be caused by an imperforate hymen. There are exceptions, however, to this rule, for instances are not uncommon where the vagina has become closed up in childhood from some injury or from inflammation of the mucous membrane. The first condition is a consequence of the introduction of a foreign body into the canal, from which sloughing and contraction followed. Of this form of injury an instance will be cited in which the passage was destroyed by the dead branch of a tree, upon which the child had fallen, entering the vagina and penetrating into the abdominal cavity through the posterior cul-de-sac. The second condition is a consequence of inflammation of the mucous membrane produced by exposure to cold or neglect of cleanliness. But the form of inflammation seldom gives rise to occlusion of the canal; and, unless sloughing has occurred, it does not leave so persistent an obstacle to the final escape of the fluid which may have been retained; but it

Fig. 41.



Absence of vagina, and retained menstrual blood.

frequently leaves the passage constricted. Whatever the cause of the retention, the external portions of the organs of generation will generally be found to be well formed, but on separating the labia, the orifice of the urethra will be seen rather lower than natural, and at the bottom of a shallow sulcus; and there will be no appearance of a vaginal opening. In absence of the vagina, the urethra is as a rule unnaturally relaxed and patulous, but the power of retention of urine remains unimpaired. I have placed on record[1] a case of a young woman, who had been married several years but had never had a menstrual show. Upon examining her I found not the slightest evidence of a uterus nor any trace of a vagina, but I discovered that sexual intercourse had been carried on through the urethra and in the bladder, without either husband or wife having suspected it.

Accidental occlusion of the vagina is a frequent consequence of child-bearing, owing to the sloughing caused by long-continued pressure. Strong injections of nitrate of silver, and other agents formerly used in the treatment of leucorrhœa, have frequently caused closure of the passage by exciting adhesive inflammation. From the application of various caustics to the upper portion of the vagina, and particularly from the use of the galvano-cautery for amputating the cervix, the os uteri becomes closed, and retention of menstrual blood follows.

Unless the injury is received at an early age, it seldom happens that the vagina becomes destroyed throughout its course, from any accidental cause, or that the vaginal outlet ever becomes so entirely changed as to present only a shallow sulcus between the labia, as in congenital absence of the vagina. The thickness of the septum between the bladder and rectum, as ascertained by means of a finger in the rectum and a sound in the bladder, will generally furnish some indication of the true condition. In the congenital form, the septum will be found as thin as the recto-vesical septum in the male, since there will have been no development of the muscular and other tissues which normally form the vaginal wall. After the vagina has been once developed, and the uterus has for a while performed its functions, the vaginal wall will remain, after accidental occlusion, even thicker than before, so that there will be little difficulty in forming a correct opinion, although the uterus cannot be detected. Even if the vagina is absent and the accumulation within the uterus is complicated by hematocele or a collection of pus in the pelvis, a careful investigation of the case ought to overcome all difficulties of diagnosis.

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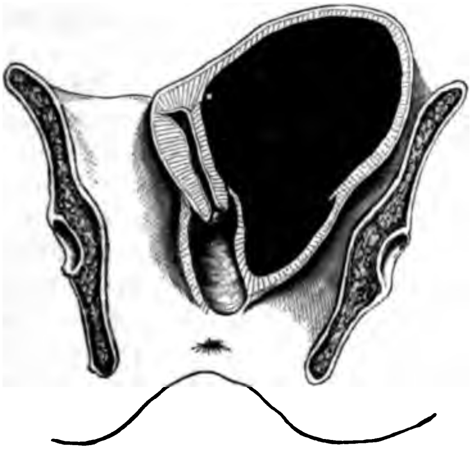
[1] Vesico-vaginal Fistula from Parturition and other Causes, etc., p. 229.

But it may sometimes be almost impossible, except after frequent examination, to determine the exact condition if there should be a double uterus with a single vagina, or two uteri and two vaginæ, as represented in Fig. 42. Some years ago, I was consulted by a woman about nineteen years of age, who had never menstruated regularly, and desired relief from a sense of pressure and bearing down which had existed for several years. She was exceedingly nervous. I had great difficulty in making a thorough examination, and was not a little puzzled as to the diagnosis. To the left of the vagina there was felt an accumulation of fluid extending as high as the finger could reach, and from the rectum an elastic and nearly globular body could be felt closely attached to the uterus. After satisfying myself as to the position of the fluid and its connection with the uterus, I unfortunately proposed to introduce an exploring trocar to ascertain the character of the accumulation. It seemed I had already lost my patient's confidence from the length of time I had taken to form an opinion as to what her difficulty was, so that my proposition was refused on the ground that she would not be experimented with any longer; I never saw the case again, and know nothing of the subsequent history.

Fig. 42.



Double uterus and double vagina, with retention.

Owing to my position as consulting physician to the Roosevelt hospital, I was recently called to see a case in the institution under the charge of Dr. Watts, one of the visiting physicians. In this case there were two vaginæ, but the uterus, or uteri, opened only into the one, and into this an accumulation took place. The other vagina which was in the median line, terminated above in a cul-de-sac, and was the one by which sexual intercourse was practised, the mouth of the vagina which led to the occluded uterus was exceedingly small and to one side, and was detected only by accident. The patient was not aware of her condition, but had consulted Dr. Watts for the removal of her sterility. Dr. Watts afterwards converted the two passages into one by dividing the septum between them. There is sufficient similarity between these two cases for me to assume that the condition of my patient as represented in Fig. 42 is a correct one for both. In Dr. Watts' case there were two uteri and two vaginæ, one of the latter being closed as if by an imperforate hymen. She was not regular as regards an external flow of blood; she never had a show at less intervals than two months, so that it is likely the two uteri menstruated alternately, the blood from one uterus being retained.

Unless the retention is due to an imperforate hymen, or to some slight barrier resulting from adhesive inflammation, nature is powerless to relieve herself. All writers agree as to the danger attending a long retention of the menstrual fluid, and are equally in accord as to the risk to life for the woman from any procedure instituted for the purpose of evacuating the contents of the distended uterus.

In consequence of the many fatal results which followed the early operations for making a vaginal tract, more recent operators have resorted to tapping the uterine cavity with a trocar from the rectum, and the various modifications of the instrument all have reference to excluding the air. But experience has demonstrated that the danger to the patient is equally great after tapping from the rectum, and as the procedure cannot give permanent relief, the operation for opening a vagina is now received with more favor. But it is now generally considered advisable that the canal should not be completed at once, and that the opening should be a very small one, so that the contents of the uterus may be drawn off slowly, in order to guard against the fluid being forced by uterine contraction through the Fallopian tubes into the abdominal cavity. My own experience has taught me to follow a course entirely at variance with that recommended by the best authorities, which is essentially the same as that adopted by the early operators.

In the *London Lancet*, August 13, 1831, a review is given of a recent work[1] by Mr. R. Fletcher. Among other operations, one is cited for opening a passage to the uterus in a married woman twenty-two years of age, who had never menstruated, and where sexual intercourse had taken place through the urethra. It is stated that after the first cut, made with a scalpel to the depth of some two inches, fearing to continue by that method, he introduced into the wound a large rectal bougie, which he advanced from time to time by taps from a mallet. "In about a week, repetitions of this practice of tapping succeeded in reaching what proved to be the uterus, which was perfectly formed, and in a healthy condition." This woman soon afterwards menstruated, and at the time of recording the case she had already become the mother of two children.

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[1] Medico-chirurgical Notes and Illustrations, part 1st.

This novel method of opening a passage does not seem to have been repeated, but, as the tissues between the walls of the bladder and rectum readily separate, the method is one which might be resorted to with advantage. When the septum is thin, by steadying the parts with two fingers in the rectum, the bougie will encounter less resistance from the cellular tissue than from the walls of either cavity. But in my opinion the operation can be completed, with less risk to the patient, in as many minutes as Mr. Fletcher occupied days in doing it.

Amussat,[1] in 1832, operated on a girl of fifteen or sixteen years of age, who had suffered for two years from retention. He abandoned the use of the knife after getting through the skin, for fear of entering the bladder or rectum, and separated the tissues by the aid of the nail and finger. After a little advance, the wound was packed with sponge for three days, when the tearing process was again resorted to, and the wound refilled with sponge. After three attempts, the tumor was reached on the tenth day and emptied by a trocar and bistoury. She suffered from inflammation of one of the Fallopian tubes, and after being relieved of the retention four times, the canal finally remained sufficiently open.

Previous to the date of my first operation, a few isolated cases are reported where efforts for relief had consisted in tapping from the rectum, or after the plan adopted by Amussat for opening a passage to the uterus. These cases were chiefly for accidental closure, and in every instance the operation was extended over several days, and the evacuation made through a small opening.

Table XIII. exhibits the cases of imperforate hymen, congenital absence of the vagina, and accidental occlusion, with retention, which have passed under my observation.

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[1] Gaz. Médicale de Paris, 1835.

TABLE XIII.—*Cases of Retention due to Imperforate Hymen, Congenital absence of the Vagina, and accidental Occlusion, with results of Operation.*

Cause of retention.	Remarks.	Result.	Private Hospital.	Woman's Hospital.	Total.
Imperforate hymen	Retention from one to two and a half years.	Relieved.	4	......	4
Congenital absence of the vagina.	....	All relieved. Case in Woman's Hospital had cellulitis.	2	1	7
Congenital absence of the vagina.	No uterus found after the operation.	Uterus subsequently developed, and menstruation became normal.	......	1	
	No uterus found. Two married and one single.	There was no menstruation, as the uterus never developed.	2	1	
Atresia of the cervix from childbirth.	....	All relieved. One case had cellulitis.	3	6	9
Atresia from traumatic injury.	....	Relieved.	1	......	1
Atresia from amputating the cervix uteri with the galvanic cautery.	Menstruation retained several times, necessitating several operations.	Relieved only temporarily; atresia returned.	1	......	1
Total number of cases..................			13	9	22

I have only met with four cases of retention due to imperforate hymen. It was impossible to determine with any accuracy the time at which the accumulation began, for in the case which had suffered, as it was supposed, for the longest period, the amount of retained fluid was less in quantity than in another in which the retention had existed less than a year. There can be no doubt of the fact that the pouring out of the first menstrual flow is delayed when an obstacle exists to its free escape (as if nature recognized the necessity), and after it has become established, the quantity is never so great from a congenital obstruction, as from one formed by accident, later in life. My impression is that the average amount of accumulation in these cases was about six ounces. I divided the hymen with a sharp-pointed bistoury, and then freely enlarged the incision with my index finger. As soon as the collections had escaped, I washed out the vagina and the partially dilated uterus thoroughly with warm water, by means of a Davidson's syringe. A small glass vaginal plug was then introduced, and removed night and morning for the purpose of having the vagina syringed out. These cases received no other treatment, except to be kept quiet in bed seven or eight days, and they all recovered without the slightest disturbance. But for the fact that cases have been placed on record where death has resulted from this simple operation, I should have regarded the danger from the procedure as being worthy of little more than a passing recognition.

By reference to Table XIII. it will be seen that there were seven cases of congenital defect in the vagina: six with entire absence, and one with a transverse septum higher up, as if it were a second hymen, about an inch from the outlet. There existed retained menstruation in two cases where the vagina was wanting, and in a third where the septum higher up acted as the barrier. The fourth case of absence of the vagina was sent to the Woman's Hospital after an unsuccessful attempt had been made to open the passage. The operator had cut through a portion of the urethra into the bladder, so that the woman had no longer any retentive power. The record of this case will be given hereafter, and is one of particular interest on account of the uterus having been developed after the opening of the vagina, and after our having failed to detect the existence of the organ, even in a rudimentary state, prior to the operation. Not the slightest vestige of the uterus could be detected in the remaining three cases of congenital absence of the vagina, nor was there subsequently any effort of nature to develop the organ.

Nine cases of accidental atresia, following difficult labor, with retention of the menstrual flow afterwards, have passed under my observation. The history of the only case belonging to this class of injuries which presented any unusual difficulty will be given to illustrate the mode of treatment, and to establish the date of instituting it.

The history of the remaining case of accidental atresia, resulting from a traumatic injury received in childhood, by which the whole canal was destroyed, and puberty delayed in consequence, will be given also.

Early in 1863 I received in my private hospital a patient, 16 years of age, who had been suffering for a year previous with all the symptoms of retained menstruation. At the first examination I ruptured the hymen without difficulty, and just beyond it I reached a thin septum through which I could detect the evidence of fluid by making pressure with a finger of the other hand in the rectum. This was my first case of the kind, although I had seen one not unlike it in the Woman's Hospital in which the fluid was evacuated by Dr. Sims[1] through a small opening, and the vagina enlarged by an operation a few weeks subsequent. I placed the patient on her side, and introduced the speculum until the septum was brought into view, when, the surface being steadied by means of a tenaculum, I cut through it with a pair of scissors. The patient was then turned on her back, and as the blood escaped I forced my finger through the opening until the septum was broken up. As soon as the flow of blood lessened, I had a bed-pan placed under her, and then washed out the vagina and the dilated uterus with warm water until the water returned clear. A glass plug or dilator, of a proper size, was introduced, she was not allowed to get up for ten days, and had no further treatment beyond the vaginal injections of warm water morning and evening.

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[1] Reported in Clinical Notes on Uterine Surgery, p. 337.

This was not only my first case of retention, but the first also in which I made a free opening, and employed warm water injections to wash away the blood from the interior of the uterus and vagina. I followed the course which seemed to me based on sound principles, without the knowledge, at the time, that the mode of treatment was not the accepted one. Amussat was about the only authority who had written from experience, but if I had been familiar with his views they would, in all probability, have had but little weight with me, since the course he proposed is well fitted for exciting inflammation and blood poisoning.

Shortly after treating the above case, another woman with retention from imperforate hymen came under my charge, and she also was relieved in the manner described. I unfortunately did not, at the time, appreciate the importance of the operation, and failed to place it on record, but at a subsequent date I reported[1] the three following cases, on which may be based my claim for a mode of treatment which additional experience has now shown to be most successful.

CASE III.—Mrs. B., of Newark, N. J., was admitted to the Woman's Hospital, April 27, 1863, with a vesico-vaginal fistula following her first labor of five days' duration and forceps delivery. Although three years had elapsed since her confinement, there had been no return of menstruation, and, with extreme prostration of the nervous system, her general health had become much impaired. On introducing the finger between the labia, at the depth of less than an inch, it passed directly into the bladder, through a transverse fissure situated at its neck, about two inches in length. From the posterior margin of the fistula, the vagina was entirely occluded. Nothing definite was gained by a rectal examination beyond the fact that pelvic cellulitis had previously existed, and the position of the uterus could not be detected.

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[1] Accidental and Congenital Atresia of the Vagina, etc., read before the New York Obstetrical Society, June 19, 1866, and published in the Richmond (Va.) Medical Journal, August, 1866.

May 10. With the patient etherized and lying on the back, two deep incisions outwards and downwards were made on each side of the fourchette, through a dense cicatricial band, involving this portion of the vaginal outlet. By an assistant, the posterior edge of the fistula was seized by means of a tenaculum, and being drawn upwards in the direction of the pubes, was put on the stretch. The vaginal tissue was then carefully divided laterally with a scalpel, in the supposed direction of the uterus. As the canal was opened up, the thumb of the left hand of the operator was advanced to put the posterior wall of the vagina on the stretch by pressure backwards, and with two fingers of the same hand in the rectum as a guide, the relative thickness of the rectal septum was preserved. A depth of nearly five inches was gained, when the hemorrhage became so excessive that a further attempt to reach the uterus was abandoned. A hollow glass plug, five inches in length by two in diameter, was introduced and retained *in situ* by a perineal bandage. The patient was placed in bed, and opium administered, after the effects of the ether had passed off. For several days she suffered much from constitutional disturbance, irritability of the bladder, and a feeling of soreness over the lower portion of the abdomen. Retention of urine resulted in consequence of the pressure exerted, and, without removing the plug, the bladder was emptied by means of a gum-elastic catheter. As the plug had controlled the hemorrhage, it was not taken out for several days, until loosened by suppuration, and afterwards large vaginal injections of tepid water were used daily until her discharge. At the end of ten days, it was found that absorption of the tissue had gradually taken place by pressure of the vaginal plug until the cervix could be felt through a thin septum, a little to the left and about four inches from the mouth of the vagina.

June 3. The septum was caught up on a tenaculum, and divided by scissors; the vagina, which had been closed throughout by adhesions, was thus opened, with the exception of a small cavity immediately around the cervix uteri, into which the latter protruded uninjured.

26*th*. The artificial vagina being now properly healed, the edges of the fistula were pared by scissors, and approximated with eight interrupted silver sutures. The edges of the fistula were sloping, as is usually the case when situated at this point, and, although two inches long on the vaginal surface, receded until the actual length of the opening was not more than half as much at the entrance to the bladder. On the ninth day the sutures were removed, and with the union perfect, she was discharged cured, July 15.

Oct. 8. She was re-admitted to the hospital, in consequence of a gradual closure of the vagina. It was found that the original condition of atresia existed to the posterior edge of the closed fistula, which, however, had remained intact, with perfect control of the urine.

On the next day, the previous operation was repeated, until the os was again reached, and a glass plug of the same size introduced. During the night, she had a violent chill, followed by an attack of pelvic cellulitis. The plug was removed, and at the end of two weeks she recovered, with closure again of the vagina nearly to the original condition.

Nov. 8. She was examined, and it was found that about an inch had been gained. At the bottom of this canal, nearer to the base of the bladder, a small opening was detected, only large enough to admit an ordinary probe. After passing some two inches, its point could be felt from the rectum, in the neighborhood of the cervix uteri. A straight, blunt-pointed bistoury was passed along the probe as a guide, and on withdrawing it, an incision was made in the median line, to the depth of half an inch, directly through this septum, on the support given by the index finger in the rectum. A similar incision was made laterally to the right and left, thus again opening the canal to the cervix uteri, so as to admit a plug nearly two inches in diameter. The hemorrhage was so great, that it became necessary to remove the plug, and introduce a larger one into the rectum; this kept the cut surfaces in contact, and controlled the hemorrhage. The opening, however, gradually contracted, although vaginal plugs were used as soon as it was safe to introduce them.

Dec. 5. The small sinus which still existed was dilated by a sponge tent, so as to admit the index finger, and free incisions were again made through the septum, for three inches in length.

Jan. 9, 1864. She returned home to recover her health, having just menstruated for the first time since her pregnancy, after an interval of nearly four years. The vaginal surface had become well healed over the plug, which had been in use since the operation, and which was only removed at the time of receiving the daily injections of tepid water.

May 25. She was again admitted, suffering from constant pain and a feeling of fulness in the pelvis. There had been no menstrual show since leaving the hospital, although the nisus had been regular. The use of the plug had been continued, until gradually it became impossible to introduce it without great pain. The canal was again closed. Through the rectum a mass, slightly fluctuating, was detected filling up the pelvis, and, with the other hand over the abdomen, the uterus was felt enlarged nearly to the umbilicus. As it was near the regular time for menstruating, she was kept in bed and under the influence of opium.

June 6. Operated in the presence of Drs. James P. White, Byford, Storer, T. F. Rochester, E. M. Moore, S. H. Tewkesbury, and other members of the American Medical Association, then in session in the city of New York. A trocar was passed from the vagina through the septum, which was, in consequence of the accumulation behind, only an inch in thickness. More than a quart of retained menstrual fluid was evacuated, with great relief, the opening was enlarged, and the cavity of the dilated uterus washed out by injections of tepid water. After ten days the discharge all ceased. With the septum so thin, and having been freely divided, every hope of success was anticipated in keeping it open permanently. In July she was discharged, after menstruating freely, and with her general condition much improved.

She returned to the hospital December 2d, after menstruating each month with increasing pain and difficulty. Through the septum, a little over an inch thick, a small sinus still remained, but only large enough to admit a probe. Its tract was somewhat enlarged by a bistoury, and four ounces of retained menstrual blood evacuated. She was placed under ether, and after introducing two fingers of my left hand into the rectum well behind the mass as a fixed point, the index finger of the other hand was forced with much difficulty through the small opening. The canal was opened by laceration, by the addition of one finger after another, until almost as much was thus gained as had been previously done by means of the knife. The hemorrhage was slight; she was kept in bed for a week, partially under the influence of opium, without any bad symptoms following the operation. Early in January, 1865, she was discharged.

Feb. 23. She reported herself for examination, after menstruating twice without pain. The vagina was now four and a half inches deep, the surface well healed, and with but little discharge. She was directed to continue the use of the glass plug for some time.

I lost sight of the case until May 23, 1866, when she visited the hospital. She was in perfect health, regular, and living with her husband happily. On examination, the vagina was found well opened, its parietes soft and perfectly healed, although of a much deeper color than natural. The plug had not been worn for several months, and was only inserted occasionally as a precaution.

This case is one of great interest. Between May 10, 1863, and December 2, 1864, she had been operated on by means of the knife five times, and, with the greatest care, gradually occlusion occurred by contraction after each operation. From December 2, 1864, when the canal was opened by laceration, to reporting the case (nineteen months), there had been no perceptible change in the size of the vagina. It can scarcely be supposed that the canal would have remained as open had she entirely discontinued the use of the plug, or were she not married; but the point not to be lost sight of is that under the same circumstances after each of the previous operations, the atresia became perfect in a few weeks. Aug. 1, 1867, she reported herself in good health, and able to live with her husband without difficulty.

Case IV.—Oct. 27, 1864, Miss N., aged 18, came under my charge as a private patient. She was a slight, delicate, and apparently an undeveloped child of not more than twelve years of age. There had been no attempt at puberty, and I was consulted in consequence of the absence of menstruation at so advanced a period. The external development of the organs of generation was found in keeping with her apparent age. On attempting to make an examination, I discovered that the vagina was absent, and only a slight sulcus between the labia. A sound was passed into the bladder, and the index finger of the left hand into the rectum; on an approximation, the intervening tissue was apparently not thicker than the vesico-vaginal tissue is usually found. After a careful exploration per rectum, I detected a small mass just within reach, which I supposed to be either a cornu of the uterus, or the organ undeveloped.

After questioning her mother carefully, I learned that her daughter had received an injury, when about seven years of age, which proved to have had a bearing on her case. She stated that while running in a wood, her daughter had tripped, over the dead limb of a tree. In falling, she ran a portion of a bough into either the rectum or vagina, and in consequence was ill a long time from "inflammation of the bowels." Again separating the labia, I detected a slight depression, and at the bottom a faint cicatricial line. I determined to operate, thinking it possible (although it is not always the rule) that puberty had been retarded in consequence of the obstruction.

30*th*. After a free action of the bowels, she was brought under the influence of ether by Dr. G. S. Winston, who assisted me. She was placed on the back, the lower extremities well flexed on the abdomen, and a sound passed into the bladder, to be held by an assistant. With a pair of scissors, I carefully cut through the cicatricial line, and with the index finger the tissue was broken down to the depth of an inch. The advance was now made in the direction of the mass felt through the rectum, by sweeping the finger laterally to the right and left, until firmer tissue was reached. When it was apparent, by the sense of touch, with a sound in the bladder, and two fingers in the rectum as a guide, that in either direction the relative distance was not preserved, pressure was made in the opposite direction, until a median course was regained. The tissue was readily broken down, and with little bleeding; the uterus was reached at the depth of three inches, in some ten minutes. The separation was continued less than an inch beyond the cervix, when the tissue became so dense that it was evident at this point that the peritoneal cavity had been entered at the time of receiving the injury. The neck of the uterus was uninjured, while the vagina had been destroyed up to and around the cervix, without involving it. The sound passed into the uterine cavity an inch and three-quarters.

A large glass plug was introduced, and retained by a bandage. During the night she was so comfortable that an opiate was not required; not a bad symptom occurred, and at the end of a week, the improvement in the condition of her nervous system was remarkable. The vagina was daily syringed with tepid water, and all discharge ceased at the end of three weeks. A month after the operation she returned home, with an injunction to continue the use of the plug and injections for several months, and, if there was no contracting of the canal, gradually to discontinue them.

Three months afterwards she menstruated for the first time, and so rapid had been the development of puberty, that several members of the family, I was informed, who had not seen her since the operation, did not recognize her. After missing a month she became regular, and has continued so in perfect health. I had not heard of the case again until her mother visited me from a neighboring State, on the 25th of April, 1876, and gave me the above history of her case after her return home.

Case V.—Miss K., aged 21, a private patient, consulted me, July 24th, 1865, having never menstruated. In appearance she was tall, well formed, and apparently in good health. Since the age of sixteen, she had been subject to sick headaches, and occasionally to a wearing pain low down in the back, but with no evidence of periodicity, as indicative of a menstrual nisus. There had been no change in her general health, but during the previous year she had become nervous and irritable in her disposition.

On examining the case, I discovered an entire absence of the vagina, and by the rectum no indication whatever of the uterus. The external organs of generation were well developed, the nymphæ unusually large, and of a dark color. The meatus urinarius was quite patulous, but not so much so as is usually the case where the vagina is congenitally absent.

The young lady, unfortunately, had been engaged to be married for several years, and her parents were exceedingly anxious than an attempt should be made to reach the uterus or to settle the fact of its absence. In consequence of the warm weather, I delayed the operation until autumn.

Oct. 5, 1865. In consultation with Drs. Thos. Cock, T. G. Thomas, and Burroughs, she was etherized and placed on the back, with the lower extremities flexed on the abdomen. After snipping the tissue with a pair of scissors, for nearly an inch in a vertical line at the bottom of the sulcus between the labia, the cellular tissue was lacerated by means of the nail and index finger, as in the previous case. High up in the pelvis, a thick transverse band could be felt from the rectum, as if it were a portion of the broad ligament occupying the position of the uterus, and stretching from one ovary to the other; at this point it sagged within reach of the finger. The advance in this direction was made with great care, in consequence of the extreme thinness of the septum, between the bladder and rectum. The existence of any portion of the uterus was the main point to be settled; therefore the false passage was not enlarged laterally more than enough to admit the finger readily. After extending it to the depth of some three inches, an absence of the uterus became so evident, that in consultation is was decided to discontinue the operation. A glass plug was, however, introduced. The bleeding had been slight. She was confined to bed, and sat up at the end of a week.

The disappointment was very great, and on being questioned whether I could be positive as to the non-existence of the uterus from the fact that it was not found in the median line, I determined to make a thorough effort to settle the point. A few days afterwards, with the assistance of Dr. John G. Perry, ether was administered, and I proceeded with the operation. The false passage was still over two inches deep; this I enlarged laterally with the finger, until I reached firmer tissue, and could feel the sides of the pelvis, as in an ordinary vaginal examination. After an advance of some three inches, I began to realize the danger of continuing the lateral dilatation to the same extent, as it was evident, from the sense of touch, that the uterus was wanting, and that the tissue was not so dense beyond. An advance was continued, however, in the median line for an inch further, until I was satisfied that scarcely three-quarters of an inch intervened between the extremity of the finger in the vagina and the edge of the band felt through the rectum.

Two fingers were passed into the rectum, and, with the aid of a hand over the abdomen, nothing could be ascertained as to the existence of the ovaries. High up on the right side a mass was indistinctly felt, but it seemed too distant for the ovary, and there was nothing to correspond on the opposite side. My impression was, that they were either entirely wanting, or in an undeveloped state.

It was remarkable, for such an operation, that the bleeding should have been so slight, and confined chiefly to the breaking down of the surfaces already well healed. A plug, a little over four inches long by two in diameter, was inserted.

During the night the stomach continued irritable from the effects of the ether, and she was restless, with a pulse of 108. Before daylight an opiate enema was administered, and repeated in three hours. She became quiet, and twenty-four hours after the operation she was very comfortable. Beyond the use of vaginal injections and anodynes when needed, she received no further treatment. At the end of ten days she sat up, but her convalescence was so tedious that she was not strong enough to return home until Nov. 24th.

I saw her occasionally in the interval, until June 15th, 1866. I then made a careful examination, both by the rectum and vagina, but there was no further indication of the existence of either uterus or ovaries. The vagina was as capacious as at the time of returing home, after the operation; its parietes were soft and of a natural color, except on the rectal septum about an inch from the fourchette, where I found several indolent-looking excrescences, to which nitrate of silver was applied. The plug, for several months, had not been used with any regularity, and only passed occasionally at night. She was in her usual good health, free from all vaginal discharge, but still nervous and easily excited. During the past eight months there had been nothing in her condition which would indicate any menstrual nisus.

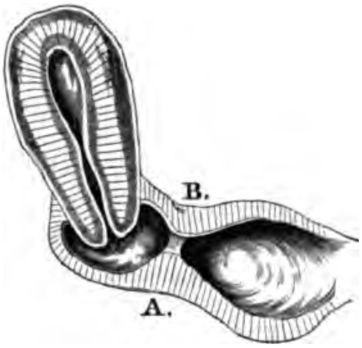
This case, apart from the interest bearing upon the subject under consideration, was an anomalous one. As a well-developed female, with this single exception, without any vicarious discharge, her general health was excellent, while there existed no indication of chlorosis, phthisis, or any organic disease. The condition of her nervous system may have been hereditary to a certain extent, for her mother is of the same temperament.

The subsequent history of this case is of interest. During September, 1866, she married, as the vagina had become healed with a surface closely resembling mucous membrane. The dilator had been introduced with sufficient regularity to keep open the passage, and I could detect but little if any change. The marriage was contracted with the full understanding of both parties that there was scarcely a possibility that even a rudimentary uterus existed, and that the probabilities were that the canal would gradually close. I heard nothing of her after her marriage until early in May, 1874, when I met her accidentally on a visit to one of her relatives who was under my charge. I had not an opportunity to make an examination, but she stated to me that her married life had been a happy one, and she was not conscious that any material change had taken place in the size of the passage. I could see no change in her appearance except that she had aged somewhat beyond her years and had become less nervous.

Case VI.—Miss L. O. consulted me Oct. 27, 1870, on the recommendation of her physician, Dr. Zakryewska, of Boston. Her age was 17, and she had never menstruated, although for two years previous, there had been every month an increase of backache, nervous disturbance, and feeling of pressure in the pelvis. The uterus was distended, as well as a small portion of the vagina, or rather posterior cul-de-sac, for from the rectum a marked transverse depression could be felt along the junction of the vagina and uterus. Fluctuation was detected in the rectum by making pressure with the other hand on the fundus through the abdominal wall.

Nov. 1. After the patient had been placed under the influence of ether, I opened a passage, about three inches deep, to the uterus, and evacuated between eight and nine ounces of menstrual blood, which presented the usual characteristics, in being free from odor, and in possessing a tar-like consistency. The uterine cavity was washed out thoroughly with warm water, a glass dilator introduced, and the case treated in other respects by the method above described. After menstruating twice without difficulty, she returned home about the middle of February, 1871, with the vagina open and healed. With the exception of a slight febrile action on the third day, there had not been the slightest disturbance during the progress of the case.

Fig. 43.



Occlusion of the vagina.

April 13, 1873. She reported herself for examination, having been in excellent health and menstruating regularly. On examination, I found an hour-glass-shaped contraction of the vagina at about half an inch in front of the cervix, through which the index finger could be passed with difficulty. The seat of constriction was situated at A B (see Fig. 43), and corresponded with the point at which the opening was made at the time of the operation between the new passage and the upper portion of the vagina, then distended with blood.

15*th*. I freely divided this encircling band with a bistoury, and the surface healed over a glass dilator before she returned home. I have not had the opportunity for an examination since, but ascertained afterwards that the vagina was still somewhat constricted, but only to a moderate degree. She has married within eighteen months, and to the present time, more than nine years after the operation, the vagina has remained open. I received, Dec. 9, 1879, the following from her present physician, Dr. Downs, of Germantown, Penn.: "In reply I would state that her general health is, and has been excellent since her marriage, and that she has never consulted me for anything except some trivial ailments, and never for any uterine or vaginal disturbance, hence I have no knowledge as to what condition her vagina is in."

While the doctor's evidence is only negative in character, it may be accepted as positive that no obstruction does exist in her marriage relation; moreover I believe that I would have been at once consulted if there had been any difficulty.

CASE VII.—Miss D. R. was admitted to the Woman's Hospital Dec. 13, 1870. The previous history of this case is obscure, as recorded, from the statement made by the patient that, after the performance of some operation by her physician, she menstruated several times at the age of fifteen and sixteen. A long interval then elapsed without a show, until after a fit of illness and a profuse discharge of pus with hemorrhage, when she had, at regular intervals, several menstrual periods, as they were thought to be. About four years previous to admission an attempt had been made to open a vagina, but apparently without the operator taking the precaution to introduce a sound into the bladder and his finger into the rectum, to serve as guides, since an opening was made into the bladder, from which she afterwards had incontinence. About one-third of the urethra, and the base of the bladder for nearly an inch beyond the neck, had been laid open. The raw surfaces had been constantly coated with a phosphatic deposit from the urine, so that the parts remained as patulous as after the accident, and the finger could be introduced into the bladder without difficulty. By the aid of the index finger in the bladder, and another in the rectum, I was unable to detect a trace of the uterus. There had evidently been, at some time, extensive cellulitis to the left and in the neighborhood of the region which should have been occupied by the uterus. Judging from the thickness of the recto-vesical septum, the case was regarded as one of congenital absence of the vagina, if not also of the uterus. Until March 10, the time was occupied in getting the parts healed, and in a proper condition for an operation, while, in the interval, on five different occasions, with and without ether, a most careful investigation had been made without gaining any additional information. It was deemed advisable to close first the opening into the bladder, before attempting the operation for forming a new vagina. After great difficulty, from its being at the bottom and to one side of a deep cone, the fistula was closed by ten interrupted sutures. Two days afterwards, she had an attack of peritonitis, and on the 16th of March her life was considered in jeopardy. Reaction took place, however, and on the 24th she was well enough to have the sutures removed; but shortly afterwards the surfaces separated, leaving the parts in their former condition. Her convalescence was tedious until May 20, when she was discharged with instructions to return in the following autumn.

Readmitted December 10, 1871, with her general health much improved, and with the statement that, for several months past, she had suffered at regular intervals with symptoms of a menstrual nisus. Her condition was not yet one to warrant any surgical interference, and she continued to remain under observation. March 19, 1872, she had a show of bloody urine, but it had ceased before I could examine her condition. May 3 a recurrence of the bloody urine took place, but no further information could be gained, beyond the fact that the escape of blood was from some point within the bladder.

June 7. While under ether, a thorough exploration was made by Dr. Sims and myself. A small body was then detected, for the first time, but we were unable to determine the question of its identity with the undeveloped uterus. With a scalpel, I made some advance in that direction, when I opened into a small sinus through which the sound was passed to so great a depth that I supposed I had entered one of the ureters just beyond its entrance into the bladder. No further attempt was made, and on June 12 she was sent home.

Feb. 10, 1873. On her return, ether was administered, and by the rectum, the finger without difficulty detected the uterus, now nearly of a normal size. A small sinus was found, as the result of the previous operation, in the vagina. Along this a probe was introduced, and its course enlarged by means of scissors and by lacerating the tissues. A passage was then continued beyond in the direction of the uterus, until the os was reached, into which the probe was passed to the fundus. A glass dilator was used for a few days, when it had to be adandoned, in consequence of the irritation it produced and a threatened attack of cellulitis. The index finger was carefully passed several times a day to the cervix, that the canal might be prevented from contracting, and, with frequent injections of hot water, the parts were kept free from the irritating effects of the urine. When healed she returned home.

April 15. The fistulous opening into the bladder was closed by twelve sutures. So much disturbance resulted, with threatened cellulitis and irritation of the bladder, that she had to be kept constantly under the influence of opium, and the bladder carefully washed out twice a day by means of a double catheter.

May 1. The sutures were removed, and the union was found perfect.

June 10. I learned that a slight escape of urine took place when walking, but, after a careful examination, it was found due to the condition of the urethra, which had been drawn backward by contraction of the cicatricial surface in the vagina. The vaginal canal had shortened very much in consequence of this contraction, but the calibre was yet sufficient to admit the passage of the finger to the uterus, and the result, under the circumstances, was considered an excellent one. She was discharged, to return again.

March 12, 1874. She was readmitted. Her general health had become established, the retention of urine was perfect, and she had menstruated regularly, with the flow lasting four days, and rather free in quantity.

May 26. The vagina was enlarged as much as was deemed prudent, without the risk of setting up a fresh cellulitis, which, it was possible, might have followed if carried too far, since the remains of the previous attack were still to be detected. She was afterwards discharged, to return at some future time, for the purpose of having the vagina thoroughly opened in case she contemplated marriage, or if contraction sufficient to obstruct the escape of menstrual flow should take place.

Three years have now elapsed since her discharge, and I am ignorant of her present condition.

CASE VIII.—Miss A. L., aged fifteen and a half years, was admitted to the Woman's Hospital March 4, 1876. She had never menstruated, but eight months previous to admission she began to suffer for the first time from pain at the hypogastrium, lasting from two to three days. Since the first, the pain had returned regularly every month, with increasing severity and duration. Only a few days previous to admission she had passed through one of these periods of suffering which had lasted ten days. Her general health was poor, and she had a marked strumous appearance. The external organs of generation were well developed, but, on separating the labia, a sulcus was seen terminating in the urethra. By placing the hand over the abdomen, and an index finger in the rectum, an elastic mass was felt like the uterus at the fifth month of gestation. The case was evidently one of retained menstruation due to congenital absence of the vaginal outlet, with the upper portion of the vagina distended, as in Case VI.

March 14. While under ether, the skin was snipped with a pair of scissors, in a vertical line below the urethra. The patient had been previously placed on the back with her lower limbs flexed on the abdomen. A steel sound was then passed into the bladder and held by an assistant on the left of the patient. I introduced two fingers of the left hand into the rectum as a guide, and between them and the sound separated rapidly the cellular tissue, by means of the finger-nail, until I had made an opening about an inch in depth. The opening was then freely enlarged, by working the finger to the right and left; after this the advance was made by sweeping my finger from one side of the pelvis to the other. This was readily done, as there had been no cellulitis, and, if I felt that I was getting too near either the bladder or rectum, I would make pressure downward or upward until I got, as it were, into another stratum. After advancing about two inches and a quarter in the median line, the septum between my finger and the fluid had been reduced to a few lines in thickness. Through this I introduced a small trocar, and drew off some twenty-four ounces of fluid. The puncture was then enlarged by introducing a pair of scissors, and the parts were lacerated by opening the blades. The finger was then passed, and a free opening made. The uterus was thoroughly washed out with hot water by passing the long nozzle of a Davidson's syringe up into the cavity. To the last quart or two of the water a little carbolic acid had been added. A large glass dilator was then introduced. The patient did well for twenty-four hours, when the pulse rose to 116, and the temperature to 102°, with headache, this being her only complaint.

16th. It was directed that she should have the injections every three hours, with carbolic acid added, as the discharge had become free, and had some odor. Five grains of quinine were ordered every four hours. She still complained of headache, and felt chilly, but there was no marked rigor. At 2 P. M. her pulse rose to 136, and the temp. to 103.7°. At 8 P. M. the pulse was 140 per minute, while the temperature had lowered to 100.2°.

17th. The discharge had become quite abundant, of a brownish color, and still slightly fetid. Her stomach was disturbed, and she vomited several times during the night. At 8 A. M. the pulse was 120, and temp. 101°; at 3.30 P. M. pulse was 130, and temperature 101.5°.

18th. Her condition was decidedly better, and she began to convalesce.

19th. There was a slight relapse; the temperature at 102.6° during the night, and a return of the headache.

20th. Detected marked tenderness over the lower portion of the abdomen, and especially to the left side, with tympanites. This was discovered after she had had a movement of the bowels from an enema.

23d. I made an examination by the rectum, and found cellulitis on the left side, extending behind the uterus. I directed that a shorter vaginal plug should be used, for I ascertained that, from the second day, the nurse had had difficulty in passing the plug into the upper portion of the vagina. I found the canal constricted at this point, as shown in Fig. 43, Case VI., and I had no doubt that if the cellulitis was not actually produced by her efforts to force the dilator through, its extent was at any rate increased by the irritation.

24th. I directed that the use of the dilator should be abandoned, but the vaginal injections were to be continued several times a day.

25th. During the night she had several loose and fetid movements from the bowels, which were examined by the microscope, and found to consist almost entirely of pus. She was placed on milk-punch, cod-liver oil, quinine, and iron.

28th. The abdominal tenderness and tympanites were found decreasing rapidly, and by the microscope, but little pus was detected in the feces. She gradually convalesced, but was not strong enough to be discharged until May 10. She had not menstruated since the operation, but this was scarcely to be looked for in her reduced condition.

June 20, 1876. She reported herself at the hospital for examination. Her general health had been improving slowly, but menstruation had not returned.

Feb. 1877. She again visited the hospital, having regained her health, and menstruating regularly. I found the upper portion of the vagina in front of the uterus so constricted that I was scarcely able to pass the index finger. The canal below had changed but little. She will return at some future time, when the canal will be enlarged. It should be noted that, at the time this operation was performed, the atmosphere of the hospital had become so bad from a defect in the sewerage, which was not discovered until afterwards, that no serious operation had been performed for several weeks, and the defect was at that time reported to have been remedied.

CASE IX.—Feb. 13, 1874, I saw Mrs. H., in consultation with Dr. James L. Little. She was a woman of thirty-two years of age, the mother of six children, the youngest being three years old. Seventeen months after the birth of her last child, the cervix had been removed by the galvanic cautery for supposed malignant disease. She suffered afterwards from cellulitis, and, in all probability, from peritonitis, so that she was confined to her bed for five months after the operation, and had never regained her health. If the diagnosis was a correct one, the disease was most thoroughly eradicated, for I found the vagina only about an inch and a half in depth, from the loss of the posterior cul-de-sac and contraction of the canal. A number of folds, radiating in one direction, gave the only indication of the probable locality of the uterus, although, by the touch, nothing could be identified but the pressure of a dense mass of cicatricial tissue, which was exquisitely sensitive. On passing the finger into the rectum, the presence of the uterus could not be recognized, and the tissues of the pelvis seemed solidified. A mass was felt above the pubes, which was supposed to be the uterus enlarged from retained menstrual blood. From long suffering and the presence of this mass of cicatricial tissue in the vagina, her nervous system had been so overtaxed that she had at length reached a condition of mind rendering her almost a fit subject for a lunatic asylum.

It would be out of place to discuss this mode of amputating the cervix, but I will simply state that for some fifteen years I have not resorted to it, in consequence of seeing just such results follow my own handiwork. It was a favorite mode of treatment both with Dr. Sims and myself in the Woman's Hospital previous to that time. I then possessed the advantage, which few have at the present day, of being able to correct my errors by observing the cases long afterwards, since they were then obliged to return for relief to the only institution of the kind in the country. When any portion of the cervix is removed by this method, stenosis is a very frequent occurrence within two years after the operation. When a surface is left to heal by granulation, cicatricial tissue must necessarily be formed, and it cannot be denied that this tissue always contracts; therefore stenosis must be a common result. But, whenever the vaginal tissue is included, we have a yet more serious condition to deal with. As soon as the vaginal tissue heals, it contracts over the stump, as if drawn with a running string, so the uterus becomes at length covered by two thicknesses of the vaginal wall. The occurrence of cellulitis, also, is not an uncommon complication, and is due to inflammation extending into the pelvis from the connective tissue about the cervix, which becomes involved at the time of the operation.

I lost sight of this case until April 8, when she was brought into my office with most violent contractions of the uterus, as if she were in the last stage of labor. The uterus could be felt through the abdominal wall, contracting with such force that I feared rupture would take place and its contents escape into the abdominal cavity. The case was so urgent a one that I was obliged to dismiss my office patients, and, with only the aid of a nurse, I placed her under the effect of ether, hoping to find some means of getting into the uterus. Failing to detect any point to guide me, I attempted to force a trocar through this dense tissue in the supposed direction of the uterus, but was unable to do so. I then plunged a sharp-pointed bistoury in the same direction, and entered the uterine cavity after passing through nearly an inch of tissue. I was unable to judge at what point I had entered the uterus, but, if through the cervix, the canal must have been closed throughout. Six ounces of fluid escaped, and it continued to flow until the following day. Through fear of exciting inflammation, I did not dare to enlarge the opening or to introduce any substance to keep it from closing. It was impossible to wash out the cavity, and the after-treatment consisted in keeping her quiet in bed and under the influence of opium. After ten days I allowed her to return home.

June 6. I found the opening had entirely closed. I then gave her ether, and, following the same course, made quite a free opening, with no difficulty, except from hemorrhage, which came from the vaginal tissue and needed a tampon for its control.

Oct. 27. She returned, stating that she had menstruated several times, and without pain, but that she had suffered very much latterly, and had had no show at the time for the last period. On the following day, with the assistance of Dr. George T. Harrison and Dr. Purdy, Jr., she was etherized, and, after making my way into the cavity I divided the tissues laterally, in four different directions, to the fullest extent, without entering the peritoneal cavity. The wound was packed with cotton which had been saturated in a solution of alum, and over this was placed a pad wet with glycerine.

30*th*. She had a chill, with a rapid increase of pulse and elevation of temperature. The dressing was all removed, and for fear of blood-poisoning, I passed a large double catheter into the uterus, and through this injected a large basinful of hot water, to which a little carbolic acid had been added. I then made a drainage tube from a portion of block tin tubing, about an inch and a half in length, dividing it into three portions, the middle one being for the tube, and I cut away from each end all but enough to form two prongs, or flanges, half an inch long, opposite to each other. This was introduced, and the prongs within the cavity were spread apart by passing a pair of scissors through the tube and then separating the blades. The prongs on the vaginal end were turned back, so that the tube became fixed in the wound like a button in a button-hole. She began to improve afterwards, and returned home in three weeks. After the next period, I introduced a hollow hard-rubber tube, some two inches long, slightly curved, and in appearance not unlike the instrument used for the trachea, with the exception that there was a long lateral slit or opening on each side. With great difficulty, and by watching her every few days, I was able to keep some contrivance of the kind in the passage for fourteen months. I then abandoned the tube, as it had caused her to menstruate too freely from the irritation produced by its presence in the canal. She was under observation for a month or two longer, and I flattered myself that I had relieved her. During the past winter she has suffered very much and, at length, she ceased to menstruate during a long attack of cellulitis, through which she was attended by Dr. Jos. C. Hutchison, of Brooklyn. She was too ill to visit me for several months, until recently, when I made an examination, and found her condition essentially the same as it was at the time of my first examination, over three years before. Her future, in all probability, is to be death from peritonitis or blood-poisoning.

CASE X.—Mrs. St. J., aged 21, was admitted to the Woman's Hospital Oct. 1, 1869. At fourteen she felt pain in the side and back with headache, and these pains returned afterwards with great regularity, as at the menstrual period, but without a show. After a careful examination, I was unable to detect any evidence of the uterus, but as she was a married woman I decided to operate for making a vagina. Oct. 12th, this was done without difficulty, by the method described, and I had already completed the canal to the depth of three inches, when I accidentally ruptured the septum just below the bottom of Douglas's cul-de-sac, and opened into the rectum. As the glass plug could not be used under these circumstances, the operation was abandoned, and the parts were allowed to close. Jan. 27, 1870, I again operated, and at the time of her discharge, Feb. 18, the canal had healed, and was four and a half inches deep. No uterus was found, and the case has only been presented to show that accidental rupture into the rectum is of little consequence beyond the delay it involves.

It is essential that the whole operation for forming a vagina be completed in one sitting, and that the passage be made much larger than it is proposed that it should ultimately be, since it will contract under all circumstances. If the operation be only partially performed, and afterwards completed, contraction will always take place at the point where the first ended, and the second began. This will be a source of irritation afterwards, as the band will always have to be overstretched before the other portion of the canal can be dilated. The surface of the canal is essentially a cicatricial one, and will consequently contract to a greater or less extent; but when healed over glass it approaches nearest in character to mucous membrane. When tissues are divided by the knife, the contraction is always greater than when lacerated or broken up by means of the scissors. If a passage be opened by the knife alone, the plug will be gradually expelled by adhesion of the surfaces from above downward, until the original condition is attained. This will always occur, unless some portion of the mucous membrane has remained intact at the upper part of the canal. When merely a section of the vagina has been divided, the required diameter can be preserved as long as a bougie is retained, but after discontinuing its use, the incised tissue will gradually contract until the false passage becomes obliterated, or reduced to a mere sinus. Experience teaches us that a surface which has been lacerated heals with less rapidity than one divided by the knife. Consequently, if the tissues are cicatricial in character, we will gain time for the modifying effect of the absorption which will be excited by the pressure of the dilator.

A common and undesirable result is often obtained in the operation for opening a vagina, as shown in Cases VII. and IX., in each of which a constriction was left. To avoid this, it is necessary that the new canal, opening into the portion dilated, should be as large in diameter, if not larger than any other part, since that which has been overstretched will contract with greater rapidity, thus leaving this constricted portion as a source of irritation afterwards. Whenever the canal has been opened throughout by a single operation, and to a uniform calibre, it can be kept open afterwards for an indefinite period without irritation, by the introduction, daily, of the glass plug, and retaining it for a few moments.

It has been recommended by all writers that the retained menstrual blood shall be evacuated slowly, through fear that it may escape by the Fallopian tubes into the abdominal cavity. I regard this fear as based entirely on theoretical views. Dilatation of these tubes throughout their length must certainly be rare. If it were so easy for the retained fluid to escape through the tube, it would always be driven out into the abdomen by uterine contractions, for they are frequent long before a necessity is recognized for surgical interference. If it were known that they were dilated and filled with fluid at the time of the operation, it would be better for a free opening to be made below, as the fluid would naturally flow in the direction offering the least resistance. No attempt should be made to aid the expulsion of the fluid from the uterine cavity by manipulating the organ through the abdominal walls. Should the Fallopian tubes be distended by fluid, such interference would be more likely to rupture them, or to force the blood into the abdominal cavity, than would the uterine contraction.

After the uterine cavity has been emptied, its walls will remain smeared with the tar-like fluid, which cannot be gotten rid of for several days, until it has become partially decomposed and broken down to a watery consistency. On account of the anæmic condition of the patient, and the irritable state of her whole system, she is the more susceptible to blood-poisoning, and it is remarkable, under the circumstances, that it does not occur much more frequently. After all due care, it is often impossible to secure entire immunity from this danger, or from inflammation; yet it must be, beyond question, greatly lessened by thoroughly washing out the uterine cavity.

Dr. C. H. F. Routh reports[1] a case of congenital absence of the vagina, with retained menstruation, on which he operated for opening a vagina, Jan. 7, 1870. The passage was made chiefly by aid of the finger, and the fluid was allowed to escape by a small opening. "Its exit was helped by an injection of a weak, warm watery solution of iodine." A large gum-elastic catheter was left fastened in the opening with tapes. The same weak solution of iodine, to which carbolic acid was added, was used to wash out the canal as the discharge became profuse. Death resulted on the seventh day. It was found at the post-mortem examination that a teacupful of the fluid had escaped into the abdominal cavity through an aperture in the dilated tube, on the right side, which "was sloughy looking."

In the progress of this case, which lasted a week, there were symptoms of blood poisoning, but not such as would have been expected had this quantitity of fluid remained in the abdominal cavity from the time of the operation. Therefore, in the absence of extensive peritonitis, I believe rupture of the tube took place but a short time before death. Inflammation and sloughing of the tube had been going on for several days, in consequence of the distension, and the blood poisoning may have originated from this condition. Rupture and escape of the fluid into the abdominal cavity was evidently but a question of a few days, and might have taken place when she "was rather frightened by noise in an upper ward, and said she felt as if something had turned completely in her inside." This was at an alarm of fire, and it is reasonable to suppose that rupture did occur at this time, as shortly afterwards "the whole aspect of the patient was indicative of shock and internal hemorrhage," a condition which continued until her death.

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[1] "On a Remarkable Case of Absence of Vagina, etc." Transactions of the Obstetrical Society of London, vol. xii. p. 34.

As the fluid did not escape from the fimbriated extremity of the tube, when subjected to compression, it may be assumed that the canal had been dilated from the uterus. In other words, that the mouth of the tube entering the uterus was the most dilated portion when the organ was distended. If this be true, the fluid would have passed out of the tube into the uterus, had there been a free outlet below for its escape at the time of the operation. The probabilities are all in favor of the supposition that, with a free outlet, the fluid would have been drawn out in the direction of the current before it became imprisoned by the gradual contraction of the uterus.

Dr. J. M. Richmond, of St. Joseph, Mo., has reported[1] the result of an operation for opening the vagina in a case of complete occlusion, which resulted at eight years of age, from a traumatic injury, similar to the one described in Case IV. He followed the mode of operating recommended by me in the paper to which I have already referred. He was unable to find the uterus at the first operation, as I had fortunately succeeded in doing in my case; but a similar feature in both cases existed in regard to the uterus, in that no attempt at development was made until the vagina had been completed. Dr. Richmond's case was one of a married woman, aged 21, in whom, after a careful examination by the rectum, no evidence of the existence of the uterus could be detected. July 31, 1871, a vagina was opened to the depth of three inches, and, after it had healed, on Sept. 6, the canal was extended to nearly five inches without finding the uterus. The case was treated by injections, as I had recommended, and the parts, as in my operation, were healed over a glass plug. Three months after the last operation there was a slight show, but its source was not detected. In Feb. 1872, the menstrual blood was discovered oozing through a small opening; this was enlarged, and the os uteri found, into which a probe passed to the depth of less than two inches. The uterus afterwards developed, the woman continued to menstruate regularly, and the vagina remained open for five years while under observation.

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[1] St. Louis Medical and Surgical Journal, Jan. 1877.

The following is the after history of the case as presented by Dr. Richmond to the Med. Association of the State of Missouri, and published in the Transactions for 1878:—

"May 15, 1878.—About one year ago, I was called to see Mrs. V., and found her suffering with a pelvic abscess, from which she soon got relief by its discharging through the bladder. As anticipated, I found it urgent to give relief in some way; but, to my disappointment, there was a *complete obliteration* of the artificial vagina, which had afforded relief for nearly six years. The parts were about in the same condition as when I first saw her. Examination, per rectum, found the pelvic contents one firm mass, glued together from inflammation. It was impossible to perform any operation looking to the restoration of a communication with the womb. She menstruated a few times through the bladder, which ceased, and she would have an abscess at nearly every molimen. I felt that each abscess diminished the chance of an external discharge, and that her condition was a critical one, though she was in pretty good health; and I could not impress her seriously as to her danger. Dreading every return of the monthly molimen, and being able to do nothing else for her, she only twenty-eight years of age, I advised her to submit to ovariotomy, believing that it would stop menstruation and she would be freed from her danger. But she and her family would not consent."

"About the 23d of April past, I saw her, then suffering from another abscess, which, in a day or two, was discharged—blood and matter, as usual—through the bladder and gave relief. But this was only temporary, for I had to see her again soon, suffering very intensely with an abscess. On the morning of May 1st, she expressed herself as having gotten sudden relief from the pelvic pain, but this time there was not the usual discharge. On examination found the abdomen becoming rapidly tympanitic, and very tender; pulse rising in a little while to one hundred and fifty and growing weaker. The abscess had discharged into the peritoneal cavity. She died that evening."

"When I first suggested and urged ovariotomy and it was refused, I wrote to Dr. Sims. He advised me to correspond with Dr. Battey. I did so, and give herewith an extract from his letter: 'The 1st of February, I had a case very similar to yours, but the result of extensive sloughing following difficult labor. Two unsuccessful efforts had been made to re-establish the vagina. The suffering was such as to induce me to remove the ovaries by the abdominal route. The patient made a prompt and perfect recovery, and is now enjoying excellent health. This is, undoubtedly, I think, the remedy in your case.'

"I believe now, as I did a year ago, that ovariotomy, and that alone, offered her any hope, and, done in time, would have saved her life. You notice, from her history, that the functions of the ovaries and womb, they being hermetically sealed, remained dormant until after she was married, at the age of twenty-one, and she never had the slightest trouble until then. I lost sight of this patient for nearly three years, during which time she menstruated normally and regularly. And the good results of the operation would have lasted longer, *probably*, but she failed to carry out my instructions as to the use of the glass plug."

The following extract is from a private letter recently received from Dr. Richmond: "About five years after the operation, contraction had commenced in the upper portion. This I thought at first was due to her leaving off the use of the glass plug. But since reading your book, I am more inclined to attribute it to the fact of the canal having been completed in two operations."

This interesting case is presented at length for the purpose of impressing the reader with the necessity, in all cases, for resorting frequently to the use of the vaginal plug throughout the menstrual life of the woman; for showing the necessity of opening the entire canal at one operation, as being the only means of avoiding a certain source of irritation, from contraction, which may cause cellulitis, or closure of the vagina after the use of the plug has been given up; and also to draw attention to the proposal urged by Dr. Richmond, that the ovaries should be removed as the only means of safety. This proposal is a novel one under the circumstances, and in the future its possible advantages will have to be taken into consideration by the surgeon in many cases. Hereafter this subject will be treated of under the head of normal ovariotomy, or Battey's operation as it is termed.

Dr. Routh, in his remarks before the Obstetrical Society on the report of his case, states: "Among the few cases of absence of the vagina recorded, *I do not find any in which the case exactly resembled this, and in which the vagina was made, and the uterus punctured* *at the same time*, sponge tents having been used after incisions made, and the progress of the operation extended over several days."

This, however, was nearly four years after I had placed on record my method of operating; just six years after the operation had been witnessed by the members of the American Medical Association; and about seven years after my first case.

Amussat, in the report of his case, given several years after the operation, throws out the hint that in a similar instance he would favor the completion of the canal at one operation, but he never put the suggestion into practice. All operators subsequent to Amussat followed his teaching in opening the vagina by several distinct operations, and in the gradual evacuation of the retained menstrual fluid by a small opening. Although he broke down the tissues with his finger, fearing to use the knife, it was done to form a bed for the insertion of the sponge, and by a method entirely different from the one described by me.

I may, therefore, claim to have been the first operator on record who completed the opening of the canal at a single sitting, who separated the tissues by freely sweeping the finger from one side of the pelvis to the other; who gave free exit to the retained fluid, and then washed out the uterine cavity with warm water, that blood-poisoning might not result.

To complete the canal at one operation is based on sound surgical principles, for thus the danger from inflammation becomes greatly lessened. The entrance of the new passage into the expanded portion about the cervix, should always be made larger than any other part of the vagina, for otherwise, there will remain a constriction at that point. The formation of cicatricial bands must be prevented, since the calibre of the canal can never be said to be greater than its most constricted part, and the presence of a band always renders the patient more liable to the occurrence of cellulitis, from the irritation produced by the introduction of the dilator, or plug. Unless a dilator be frequently used, the new canal will always contract to some extent, and unless the parts are soft, and the canal of a uniform calibre throughout, it will be impossible to keep it open.

The objections to the rapid evacuation of the retained fluid are entirely theoretical. It would be impossible, on account of the tenacious character of the fluid, to empty the uterus so rapidly as to produce any shock. If such a result were likely to follow the rapid evacuation of fluid from the uterus, it should at least sometimes occur from the sudden escape of the liquor amnii.

The glass plug was introduced by Dr. Sims, to be used after having divided cicatricial bands in the vagina, that, by pressure, absorption might take place, and the parts be softened down, preparatory to closing a vesico- or recto-vaginal fistula. I was the first to employ this instrument in the after-treatment of the operation for forming an artificial vagina.

After a thorough injection of warm water has been given, and a glass plug of a proper size introduced, all the air and fluid in the vagina will have been displaced, or pressed out. The parts are thus shut out from the action of the air, and the instrument is retained in place, by atmospheric pressure, as long as the woman remains quiet. The instrument is cool, clean, and unirritating; it keeps up steady pressure on the parts, and, consequently, prevents excessive congestion. But, above all, it possesses two great advantages when made of glass, viz., that of being innocuous and transparent, so that it inflicts no injury, and allows of the surfaces being seen at all times, as through a speculum, without its removal.

I regard the washing out of the uterine cavity as the most important precaution against blood poisoning, and next in importance to this I place the use of the dilator, to which I attribute my own success and that of those who have employed the same method.

To fill a cavity, made through loose cellular tissue, as has been the general practice, with porous substances, as sponge, lint, etc., which must retain and keep the parts bathed in the decomposed discharges, establishes a condition so favorable to blood poisoning and inflammation that it is remarkable that any case should escape.

I am familiar with the fact that washing out of the uterus was recommended by some of the early operators, and that Amussat resorted to the practice with his first case. But the circumstances were very different between their mode of practice and the one employed by myself. It was accepted and followed without exception, so far as my knowledge extends, to allow the menstrual fluid to drain off by the smallest opening. Then, in the course of treatment, after the uterus had been emptied, an attempt was sometimes made to wash out, as it was thought, the uterine cavity. But with the means then so inefficient for the purpose, and with so small a quantity of water, the practice seems scarcely worthy of consideration. Amussat commenced his operation Feb. 29, and evacuated the fluid March 9, and on the 11th inst., as he states, for the first time, the tumor was washed out. Withal, this was never the accepted practice, for a rapidly fatal case of "hemorrhagic peritonitis," occurring to Maisonneuve, is frequently referred to by different writers as an objection to the method.

My success has been a remarkable one, and the result speaks for itself, as it were. With this experience, we must claim that the greatest degree of safety lies in the most rapid evacuation, and in the thorough washing out of the cavity. Not after it has been evacuated for a greater or less time, but with the view of aiding in the escape of the thick and tenacious fluid, one or more streams of warm water must be thrown, from a Davidson's syringe, into the uterus by passing the nozzle well up into the cavity. A large and steady current must be continued until the water returns clear; beginning with tepid water and gradually increasing the temperature until it becomes hot enough to excite the uterus to firm contraction; after which the introduction of the glass plug will exclude the action of the air, and the danger from blood poisoning will have been lessened to the minimum. I have never employed the antiseptic method, but am fully persuaded that the danger may be still more reduced by operating under the spray, and, until the parts were healed, by using it whenever the plug was removed.

CHAPTER XII.

PELVIC HEMATOCELE.

Definition—History—Applied terms—Source of the blood—Frequency—Symptoms —Varieties—Differential diagnosis—Treatment.

Definition.—An accidental collection of blood in the pelvis, either in the peritoneal cavity, or outside of the peritoneum, within the connective tissue of the pelvis.

A hematocele is a symptom and not a disease, simply a result of one of many different causes, any or all of which may give rise to it.

History.—The greatest difference of opinion has been maintained from the beginning, and almost to the present time, in regard to nearly every essential feature of this condition. The literature on the subject has become voluminous. The contributions from the French writers are the most extensive; in Germany and Great Britain almost as much has been written; while the subject has received comparatively but little attention in this country.

Whatever may have been the knowledge of the older writers on this subject is now of little practical value to us, since they have transmitted their views in terms too vague.

Recamier described, in 1831, a pelvic tumor filled with blood, which he cut into, mistaking it for an abscess. Other writers in Paris shortly after recorded similar cases, but to Nélaton[1] I think must be credited the first accurate description given of the pathology of the lesion. These claims of priority are challenged by Bernutz, and are granted to him by many writers. His first contribution to the subject was given in the *Archives Générales de Médecine*, 1848 and 1849. Afterwards he presented his views in a more extended paper,[2] which was translated and edited by Dr. Alfred Meadows, in 1866, for the New Sydenham Society, London. From this work I quote:[3] "To Ruysch

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[1] Gazette des Hôpitaux, 1851 and 1852.

[2] Clinique Médicale sur les Maladies des Femmes, par MM. Bernutz et Goupil, Paris, 1860.

[3] Vol. i., part 2, p. 159, note.

(1691) undoubtedly belongs the honor of having first mentioned the escape of menstrual blood into the peritoneum." "To M. H. Bourdon (1841) belongs the credit of having first described the physical signs of those blood tumors now called hematoceles, which he thought were situated in the peri-uterine cellular tissue, but whose relation to menstrual irregularity he entirely ignored." "M. Velpeau (1843) had the honor of first diagnosing during life one of these blood tumors, without having recourse to an exploratory incision, though he did not recognize its exact situation nor its relation to menstrual disturbance." "I may, perhaps, be allowed to state that: 1st. No one can claim to have preceded me in pointing out the relation which exists between these blood effusions, now called hematoceles, and disturbances of menstruation," etc. "2d. That hardly any addition has been made to the anatomico-pathological description of hematoceles which I first sketched out."

Dr. Tilt, a student of Recamier, was the first English writer to describe the condition, in a paper read before the Medical Society of London,[1] and in the second edition of his work. Dr. West also describes the lesion in his work, which was published about the same time. Professor Simpson recognized the accident in 1854, and afterwards published an account of the case in the *Medical Times and Gazette*, 1859, and subsequently in his works. A knowledge of hematocele became more general after the clinical work of Bernutz and Goupil was published. One of the most complete cases on record was presented by Dr. Henry Madge in a paper "On Uterine Hematocele," published in the *Transactions of the London Obstetrical Society*, vol. iii., 1861. Dr. Matthews Duncan, of Edinburgh, contributed a valuable paper on the subject to the *Edinburgh Medical Journal*, 1861. An extended article "On Pelvic Hematocele, with special reference to its Diagnosis and Treatment," by Dr. Alfred Meadows, was published in the *Transactions of the London Obstetrical Society*, vol. xiii., 1871. The works of Tilt, Bennet, West, Simpson, Churchill, McClintock, Hewitt, Barnes, and others, all contain additional material gathered from personal observation.

In Germany, Prof. Braun, of Vienna, in 1861, wrote an extended article on the subject of hematocele, and Virchow, Olshausen, Fritsch, Schrœder, Beigle, Klebs, and others have made valuable contributions.

The most complete treatises in the French language are by Bernutz and Voisin [1860]; in the German, by Dr. C. Schrœder;[1] and in the English that by Dr. Tuckwell, Oxford, 1864.

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[1] Published in the London Lancet, 1853.

In this country, as I have stated, there seems to be but little literature on the subject beyond the reports of isolated cases scattered through the journals. Prof. G. S. Bedford, of New York, in 1855, recognized the existence of a hematocele in a case presented at his clinic. The tumor was tapped, and a description of the case is given in his work on the diseases of women. Dr. John Byrne, of Brooklyn, in 1862, read a paper on hematocele before the New York Academy of Medicine, which, after being extended, was published by Wm. Wood, New York, 1862. This monograph contains the report of several cases, and was a full digest up to that time, and was, I believe, the first paper printed on the subject in this country. *The American Journ. of Obstet.*, New York, August, 1873, contains "Remarks upon the Diagnosis of Pelvic Hematocele," by Dr. Lee,[2] who reports some cases under his observation, and is valuable for its bearing on the differential diagnosis. In the *Virginia* (Richmond) *Medical Monthly* for October and November, 1875, will be found an extensive article on "Retro-uterine Hematocele—a Gynæcological Study," by Dr. Harrison.[3] Some cases are given, and the literature on the subject is very complete. The paper is written to show the chief source of hemorrhage in cases of hematocele, and will be again referred to.

Applied Terms.—Bernutz prefers the term peri-uterine hematocele, as expressing the fact that the blood may accumulate at any point about the uterus. He was of the opinion "that the bloody tumor which is left as the remains of a hematocele has no right to be regarded as a specific disease, apart from that which caused it," "the hemorrhage itself being regarded merely as a symptomatic expression of these morbid conditions." Nélaton termed the condition retro-uterine hematocele, since he considered this to be the only locality in which it is found. Voisin uses the same term, and, with Bernutz, held that a true hematocele could only consist of an effusion within the peritoneal cavity. Simpson, on the contrary, considered a hematocele to be usually formed by hemorrhage taking place outside of the peritoneal sac; while Bernutz designates such a blood tumor in the cellular tissue as a pelvic hematoma or thrombus. These views are held by Meadows and others, with the further distinction that, as a rule, the hematoma is connected with the puerperal state, or is the result of an injury.

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[1] Kritische Untersuchungen über die Diagnose der Hæmatocele Retro-uterina, u. s. w., Bonn, 1866.

[2] Charles C. Lee, M.D., Assistant Surgeon to the Woman's Hospital of the State of New York.

[3] George T. Harrison, M.D., Assistant Surgeon to the Woman's Hospital of the State of New York.

Source of the Hemorrhage.—Bernutz regarded the source of blood as in the uterus, and that it was simply the retained menstrual flow, which regurgitated through the Fallopian tubes. This view seems to merit scarcely more than a passing remark. It is now well known that the contents of a distended uterus never pass into the peritoneal cavity, unless by rupture of the organ itself or of the uterine portion of the tube which may have become dilated. Trousseau held the same view as to this being a source, but, in addition, that by exhalation the hemorrhage might take place from the mucous membrane of the tube itself. This might possibly occur, under certain circumstances, from that portion near the fimbriated extremity. Nélaton conceived that the origin of the hemorrhage was from a rupture of a Graafian follicle, the blood naturally gravitating from the surface of the ovary to the bottom of Douglas's cul-de-sac, the most dependent point. Dr. Madge, in support of this view, refers to the then well-established belief that the fimbriæ of the Fallopian tubes continued to grasp the ovary during the menstrual period, so that not only the ovules but all the blood and secretions from the ovaries and tubes passed into the uterine cavity at the same time. These views were advanced by Rouget, and supported by Gaillard, who even believed that this was the chief source of the menstrual blood. Dr. Tyler Smith, in the discussion on Dr. Madge's paper, considered the blood of a hematocele "to be essentially a form of ovarian or Fallopian menstruation, vicarious in character." Unless under some unusual condition, the blood lost upon the escape of an ovum is very small in quantity; and from the frequency with which the fimbriæ are found bound down by adhesions after death, hematocele would be of far more frequent occurrence if it were true that the blood escaped in this manner.

A number of cases have been placed on record where the hematocele has been formed in the peritoneal cavity by the rupture of a distended ovary from hemorrhage taking place within its own stroma, and this accident has been termed ovarian apoplexy. Bichât in his Surgical Anatomy, and Devalz in a treatise on "Utero-ovarian Varicocele" call attention to the extravasation of blood from a rupture of the utero-ovarian vascular plexus forming a hematocele. After repeated pregnancies, or from any cause where the venous circulation has been much obstructed, the vessels become varicose. A change is then brought about in the coats of these vessels, and being without valves their power of resistance is greatly lessened. Under these circumstances, and with a condition so common, it is a matter of surprise that the accident does not more frequently occur. In fact, a glance at Savage's plates, showing the venous circulation about the uterus, should convince any one that rupture of these vessels must be one of the most frequent causes of extravasation of blood into the cellular tissue, and secondarily into the peritoneal cavity. This rupture may occur—

1st. From the mass of vessels known as the bulb of the ovary, and then it would pass into the peritoneal cavity.

2d. From the pampiniform plexus and network of vessels under the tubes and between the folds of the broad ligament. The blood may then be either extravasated into the cellular tissue, or, by rupture through the sides of the ligament, pass into the peritoneal cavity.

3d. From about the vaginal junction, at the bottom of Douglas's cul-de-sac, or at some point in front of the uterus, but outside of the peritoneal sac, so that the infiltration would pass into the connective tissue of the pelvis.

Rupture of one of these vessels may readily happen about the time of the menstrual flow, during childbirth, or from a miscarriage. I have known it to occur, as an exception to the rule, without any reference to the time of either menstruation or pregnancy. Hematocele may result from excessive sexual intercourse, from any prolonged exertion, from direct violence, and even, it is claimed, from sudden mental shock. Rupture of the Fallopian tube, from tubal pregnancy, or of the sac of an extra-uterine abdominal pregnancy, or of the uterus itself during the progress of labor, almost always causes serious hemorrhage into the peritoneal cavity. Some observers have attributed hemorrhage in the peritoneal sac to the cachectic condition accompanying anæmia, chlorosis, purpura hemorrhagica, and some of the eruptive fevers.

Virchow has pointed out a common source of hemorrhage from the new capillary vessels found in the false membrane or other products of a local peritonitis. This takes place just as a clot is formed on the dura mater between different layers of exudation or false membrane. Accumulations in the peritoneal cavity gravitate into Douglas's cul-de-sac, and become encysted if inflammation should be excited ; or the blood may remain free, forming only a pool or clot in the most dependent portion, according to the rapidity with which it has escaped.

Hematocele occurs, as a rule, about midway in menstrual life, at a time when the organs of generation are most active. Yet cases have been reported where it has taken place several years after the normal cessation of menstruation.

Hematocele is most common among those women who have borne a number of children in quick succession, yet it is not an uncommon accident with the sterile, while it is a rare occurrence among the unmarried unless as a result of violence.

We find on no other point does there exist a greater difference of opinion than as to the frequency of this accident. I think the varied experience has been due to different classes of patients, and the different circumstances under which they were treated, *i.e.* whether at home or in hospital. It is a comparatively rare affection among the wealthy and better classes, except in connection with the puerperal state. In all of its forms the lesion is most common among the poor and overworked. Again, physicians visiting at patients' homes will see a much larger proportion of cases than those whose practice is confined chiefly to the office or to the wards of a hospital. In twenty-five years there have been but four cases of hematocele treated in the Woman's Hospital, and in sixteen years I have had but three in my private hospital. On the other hand, during the same time I have been called by physicians in general practice to see a number of cases in consultation, or to determine the character of the lesion. The explanation is evident, the onset of the disease is generally too sudden and violent in character to admit of removal to a hospital. Some writers have considered that locality has something to do in determining the frequency of this accident.

If we limit the acceptation of the term Hematocele to an accumulation of blood confined to the peritoneal cavity, the accident is comparatively a rare one. But if it be held to embrace all blood accumulations in the pelvis, the occurrence is certainly a far more common one than the profession at large have any conception of. The occurrence of cellulitis, which is often supposed to be the primary difficulty, is frequently excited, I am satisfied, by some unappreciated and insignificant loss of blood from the rupture of a small bloodvessel. Rupture into the connective tissue must be a frequent occurrence, and while this may account for many of the sudden attacks of cellulitis, it as often takes place without producing any appreciable disturbance. We are obliged to acknowledge our ignorance of the law determining the certain degree of immunity which does exist. Under ordinary circumstances, the extravasation of a small quantity of blood should produce little or no irritation, and I have detected, by accident, in one instance, quite an accumulation of blood going on in the peritoneal cavity without the patient suffering any discomfort. Yet frequently the shock to the nervous system will be profoundly expressed from the first escape of blood, and without bearing any relation to the quantity, unless it be excessive. Again, the blood may escape into either the peritoneal sac or into the cellular tissue, when, after a certain amount of shock, reaction may take place promptly, and the mass be rapidly absorbed without having excited any inflammation. Yet symptoms of cellulitis or peritonitis will be as often manifested from the slightest escape of blood, and without there being, in their degree, any close relation to the extent of effusion.

Symptoms.—An attack of hematocele may be preceded by pains about the pelvis, and a feeling of discomfort from an increased quantity of blood flowing to the parts, but the bearing of these symptoms is likely to be overlooked or attributed to other causes. Menstruation, if existing at the time, may suddenly cease, or may have been unduly prolonged before the attack without any apparent reason. But a sudden attack, without any premonitory symptom, is the rule, and, while the symptoms are often less urgent than would seem justified by the extent of hemorrhage, the degree of suffering will be a better indication of the prognosis. A sudden and excruciating pain over the abdomen, but more intense about the region of the pelvis, may be given as the first symptom of hematocele. The pain will be accompanied by nausea or vomiting of bile, and with all the symptoms of collapse from shock to the nervous system, or from loss of blood. The extremities may be cold, the skin bathed with sweat, the features pinched in appearance, and the pulse rapid and weak, or imperceptible at the wrist. There can be no mistaking the gravity of the attack if a serious one, for the collapse will be as marked as cholera. The pain is beyond every other symptom the most characteristic, and is as excruciating as if the tissues were being torn apart with violence. In addition, there may be great irritability of the bladder, and tenesmus, excited by pressure of the mass.

These symptoms may gradually subside in intensity, and convalescence set in, or an aggravation may take place in a short time from fresh hemorrhage attended with a more profound degree of collapse than before, or even death may soon result. In other instances the first effusion of blood may have been slight, or may not even have been recognized until an attack of cellulitis comes on. This latter condition may then become complicated by additional hemorrhage forming sible to evacuate the bowels, and the introduction of the catheter may be necessary to relieve the bladder.

The most extensive accumulation of blood may suddenly find an exit by rupture into the rectum, and be followed by recovery; or, if encysted, the rupture may be into the peritoneal cavity, with almost immediate death from shock. If neither rupture occurs, nor absorption of the blood takes place, rigors come on and are followed by an elevation in the temperature, and perhaps a pelvic abscess, blood-poisoning, or death from exhaustion.

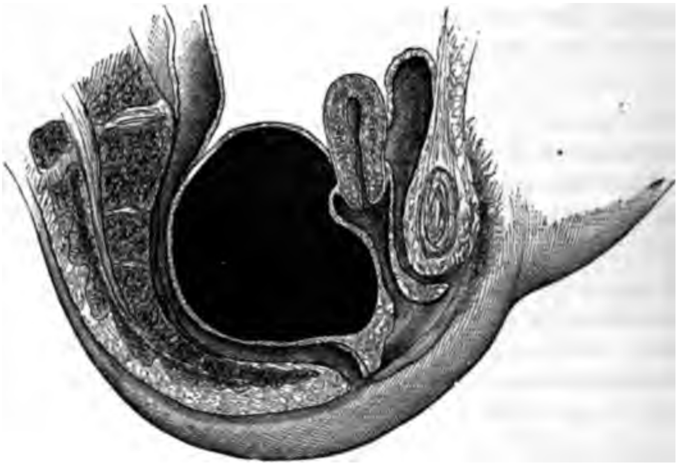
By studying the history of several type cases of hematocele, the reader will be better able to appreciate not only the location of the hemorrhage, but also the symptoms which usually accompany the different forms of the lesion.

Case XI.—Mrs. W., aged thirty-two years, of Stamford, Conn., came under my care in Oct. 1864. She had given birth to five children in rapid succession, and had been a confirmed invalid since the birth of her last child, which was nearly two years previous to consulting me. The uterus was found very much enlarged and anteverted, while at the same time it sagged quite low in the pelvis. The perineum had been lacerated, and the vagina was relaxed, and there was a partial cystocele.. A number of hemorrhoids were discovered, but the condition of the rectum was considered the most urgent feature in her case. She had been unable to stand beyond a few moments at a time since the birth of her last child without exciting nausea and tenesmus, and a feeling of great fulness about the pelvis, but while in bed she was comfortable. So far as I had any means of judging, her complaints were out of all proportion to the local disease, and I charged her with having contracted the habits of an invalid. This statement mortified her exceedingly, and she expressed a determination to carry out every direction. Without giving her time for reflection I called two nurses to get some clothing on her, and directed them to support her on each side, as she was being walked back and forth in her room. In a few seconds she complained of a feeling in the pelvis as if she would burst, and of being nauseated. I persisted, however, that she should continue the walk, as the only means by which she could regain the use of her lower limbs, but she soon became deadly pale, vomited, and fainted. She was then put to bed, and I was more puzzled than before as to her condition.

After some preparatory treatment, I operated for the removal of the hemorrhoids, with a good result, and then began to make aplications of iodine within the uterus, with the hope of reducing its size.

On one occasion, when within a few days of the time for her menstrual period, I had more difficulty than usual in drawing, with a tenaculum, the cervix forward enough to admit of the introduction of the application within the uterine canal, and in doing so I gave her great pain. It had been my custom to leave this case until the last, as she required so much time and aid from the nurse, and on this day I left the house without indicating my route. At the end of an hour I returned by the merest accident, and found her almost in a collapse, suffering from excruciating agony, and bearing down as if in the last stages of labor. She had complained of great pain from the moment of my examination, but until she began to vomit, the nurse had not appreciated her condition. Then becoming alarmed at her appearance and suffering, she had given a large injection of McMunn's elixir of opium into the rectum. She had also given some stimulant by the mouth, which was at once rejected; a mustard plaster had been placed over the stomach, and heat had been applied to the extremities. When I first saw this woman's face, her features wore an expression of such extreme suffering that the impression can never be removed from my mind. She was bloodless, and her features pinched in appearance, and her eyes bloodshot and apparently starting from their sockets. She would at one moment utter the most piercing single shriek, and then bear down as if she would drive the contents of her body from her. The muscles of her face twitched, and her fingers were firmly clenched. Her skin was covered with a clammy sweat, and as she tossed her body to and fro she would vomit, and stain with bile her night dress and the bedclothing about her. I attempted to make a vaginal examination, and felt a mass like a child's head pressing on the perineum, and crowding the uterus above and behind the pubes, so that I could only touch the os uteri with difficulty. I was unable to pass my finger into the rectum to a greater depth than an inch and a half, since the gut was firmly compressed into the hollow of the sacrum. While a finger of one hand was in the rectum, and the other on the abdomen, I could map out a hard mass filling up

Fig. 44.



Retro-uterine hematocele.

every portion of the pelvis, and extending into the abdominal cavity at some distance behind the displaced uterus (see Fig. 44). I had never seen an hematocele of such magnitude, and as I could not detect any fluctuation I would have been unable to form a diagnosis if I had not made a careful examination a short while before. As the mass was below the uterus, and between the vagina and rectum, it was evident that a large bloodvessel had been ruptured. The blood had then dissected up the recto-vaginal septum, crowding the uterus and bladder forward above the symphysis, and lifting at the same time the bottom of Douglas's cul-de-sac until rupture into the peritoneal cavity had become imminent.

Failing in an attempt to reach the bladder with a catheter, I made up my mind that the only course to follow was to relieve the pressure at once, as the patient was now beginning to sink from exhaustion. I plunged a long narrow curved bistoury into the centre of the posterior wall of the vagina as it protruded from the separated labia, but only a few drops of blood escaped. After introducing a probe some distance without resistance, and being evidently within a cavity, I passed, in its place, a curved canula and trocar for some four inches. On withdrawing the trocar, over thirteen ounces of bloody serum were drawn off, with great relief to the patient. It was then easy to empty the bladder, and upon doing so the patient became comfortable. As the pressure was relieved the vomiting ceased, and reaction soon came on, aided by a small quantity of stimulants, followed by an opium enema. After passing my finger into the vagina, I found the uterus nearly in a natural position in regard to the sides of the pelvis, but much higher than normal. The fluid blood above had evidently been drawn off, reducing the bulk about one-third, but still leaving a large mass, or clot, below the uterus, and between the separated walls of the vagina and rectum. On the next day there was some febrile reaction, with tympanites and a moderate degree of tenderness over the abdomen. But by the use of a large flaxseed poultice, and after a dose of oil had acted, these symptoms passed off. She was of a constipated habit, and unfortunately there had been no action of the bowels for several days before the occurrence of the accident. I appreciated fully the risk of causing fresh hemorrhage from administering a purgative, but under the circumstances it was a choice of what seemed to be the lesser evil. On the third day fluctuation could be detected in the lower portion of the mass, while there seemed also to be some increase in its size. While now waiting in expectation, and watching the progress of the case, the patient was kept perfectly quiet in bed, and not allowed even to sit up. The only treatment consisted in the employment of every means to sustain her strength. On the fifth day she had a slight chill with fever, and sweating afterwards, and a restless night. The following day I made a careful examination, and found that while the mass did not extend so high in the abdomen as after the tapping, yet it had gradually increased in size below, so as to fill the pelvis almost as much as before. The patient, however, did not suffer pain as when the hematocele was forming, but the bowels could not be acted on, and she was unable to empty the bladder without the aid of the catheter. As there was fluctuation and every symptom of an abscess forming, I again determined to puncture with a bistoury near the previous opening. On doing so, a quantity of offensive pus, bloody serum, and broken-down clots escaped. The opening was then enlarged enough for the introduction of the finger, when a large mass of broken-up clots slowly passed away. As there was no fresh bleeding, the patient was placed on a bed-pan, and while the edges of the wound were kept well apart by the limbs of a pair of spring forceps, the cavity was washed out. I used warm water, to a basin of which I added a sufficient quantity of Churchill's tincture of iodine to give it a decided color. The iodine I employed as a disinfectant, which then took the place of carbolic acid as used to-day. The water was thrown in by means of a glass syringe with a long curved nozzle. I very carefully injected the water so as to wash off the sides of the cavity, from which the fluid had a ready escape into the bed-pan. I had a tampon ready, and every preparation made to arrest bleeding, if it should occur, by plugging the vagina from about the uterus downwards. But as I was careful to use no force, and as the position of the uterus was not disturbed, I did not anticipate any bleeding at so late a date, unless from the walls of the cavity. This I felt certain I could have controlled by keeping the sides in contact by means of the tampon in the vagina. As a precaution, however, I kept a small portion of cotton packed around the cervix for twenty-four hours afterwards, with a drainage tent of lampwick in the opening below. On the following day I again washed out the cavity in the same manner; by the third day the discharge had greatly diminished, it lessened day by day and had nearly ceased at the end of a week. This woman made a very tedious convalescence from the great loss of blood which she had sustained, but at the end of three months she was walking about, and with comfort. As the cavity contracted it brought the uterus into position, and it no longer prolapsed, but was held by adhesions at some point in the pelvis where the circulation was no longer obstructed.

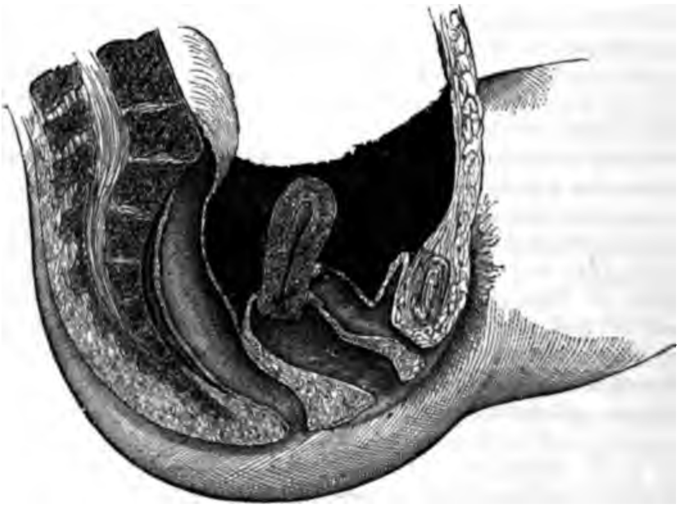
The veins in the pelvis of this woman must have been in a varicose condition, and doubtless became enormously distended as soon as she stood on her feet, so that she then suffered from nausea as if from a sudden loss of blood. This supposition is corroborated by the existence of the hemorrhoids, and the enlargement of some veins about the labia, as in pregnancy.

Evidently a large vein was ruptured in the neighborhood of the cervix when the attempt was made to draw the neck of the uterus forward for the introduction of the applicator. By pressure of the clot, and from contraction of the sac afterwards, a large number of these vessels must have become obliterated. Thus by an accident a result was accomplished which probably could not have been obtained by the best directed measures, or until nature should have completed the process attending a change of life.

CASE XII.—Mrs. L., aged 32, was admitted from the city, Jan. 7, 1875. She had menstruated for the first time at 12, free from pain, the flow lasting five days; she became regular after six months. She had married at sixteen, bore her only child at the age of twenty by a natural labor, did not again become pregnant until three years before admission, when she miscarried at three months and a half, and had not been well since. She at that time lived in New Mexico, and being unable to procure the servants needed in her household, she got up too soon, and was seized with an attack of cellulitis, which kept her in bed for eight months. Since that time menstruation had been irregular, painful, and scanty. She was unable to either walk or stand without pain; her general health was very poor, and she had become exceedingly nervous. She had recently consulted a physician, in consequence of an irregular show, who made a diagnosis of cancer, and sent her to me. When I examined her for the first time, I felt what seemed to be an epithelioma on the cervix; the uterus was en-enlarged, and tilted somewhat to the left side, from the shortening of the left broad ligament after a cellulitis. I could give with the finger a certain degree of rotatory movement to the growth on the cervix, in which the uterus itself did not participate. She was placed on the side, and on the introduction of the speculum I discovered that a large mucous polypus had been forced out of the uterus, but with a pedicle so short that the mass was crowded over the cervix, covering it almost as a percussion cap would the nipple of a fowling-piece. The traction of the pedicle was sufficient to obstruct the circulation, so that the color closely resembled that of epithelioma, and its surface had become irregular and granular. In fact, it required a good light to determine its true character. Jan. 11, I removed the mass in the presence of, and after a careful examination had been made of the case by, my assistants, Drs. George T. Harrison and Bache Emmet. I tightened a slip-knot of coarse twine, which found its way around the pedicle, and during traction an edge of the mass was lifted, so as to bring into view the pedicle, which was divided with a pair of scissors. To add to the deception, an opening existed where the os should have been, and the probe could be passed for some distance in the direction of the pedicle. When it was removed, there remained on the under side a deep depression, as would be found in a half-grown mushroom. Her recovery after so simple an operation was tedious, and she complained frequently of pain in the left side, but only where she had often had it previous to the operation. On examination a slight thickening and some tenderness were detected along the left broad ligament. Hot water vaginal injections were ordered, and the frequent application of iodine over the lower portion of the abdomen. Ten days after the operation, Jan. 21, the period returned out of time, and was very free; she was kept in bed, but with no other treatment beyond that directed to improve her general condition. Feb. 12, the menstrual flow returned, and, as it was very free, she was still kept in bed. Two days later a large clot was expelled by uterine contrations, and shortly afterwards another, with the same character of pain.

She was then seized with a severe pain over the left side, and this was followed by a chill. On making an examination it was found that the thickening had increased in the broad ligament to nearly the size of a hen's egg. A poultice was applied over the abdomen, and opium administered by the rectum. For some hours afterward she had profuse sweating, which was attributed to the effect of the opium. The flow now became too free, and gallic acid with cinnamon water was given every two hours, but there had remained no pain after applying the poultice on the 14th instant. Feb. 18, she called my attention to an enlargement in her abdomen. After making a vaginal examination I found a large mass on the left side, extending a little above the crest of the ilium and backward, filling up the posterior cul-de-sac. The uterus was in the midst of the mass, and but little displaced beyond a partial prolapse (see Fig. 45). There was no tenesmus or irritation of the bladder, the temperature was 101° in the vagina, and the patient was even unwilling to remain in bed. A certain amount of cellulitis, which had existed before, was rekindled after the operation, and rupture took place through the folds of the broad ligament into the peritoneal cavity, but the blood was thrown out so slowly that no marked symptoms were excited. This was supposed to have been the course, yet the hemorrhage may have escaped from the surface of the ovary. The flow stopped Feb. 19, and again returned March 14, but with less pain than usual, and lasted only four days. She was then placed on large doses of the iodide of potassium, and after this had been taken for some twelve days, it was noticed that from some cause the clot was being rapidly absorbed. Soon she

Fig. 45.



Hematocele in the peritoneum.

was able to get out, and on March 27, an excitement, consequent upon having had her pocket picked, brought on the flow, which lasted until April 7. Thirteen days later, in consequence of over-exertion, she again had a flow, which lasted six days. May 2, ordered a blister, as the uterus was still enlarged and immovable, but the mass in the cul-de-sac had disappeared, and the one through the abdominal wall on the left side had been greatly reduced in size. On May 4, it was found that an increase in the size of the mass had taken place; she had felt listless for several days previous. She gradually, however, improved, and on her return home, about the middle of June, the mass had so far disappeared that it would have been overlooked by any one not familiar with her history.

This case illustrates in a marked manner the differences in the degree of disturance met with in such cases. The effusion of blood was as great as, if not even greater in quantity than, with the first case, and yet the accumulation took place so gradually and imperceptibly, as to attract no attention.

The following case occurred in the Woman's Hospital while I was Surgeon-in-Chief, and in the service of Dr. Harrison. I quote the case as cited by him in his paper[1] already referred to.

CASE XIII.—"*Feb.* 15, 1871. Mrs. A. F. was admitted to the Woman's Hospital with the following history: Menstruation appeared first at the age of eighteen, and until within the past two years showed no abnormal features. She was married at the age of twenty; her husband died not long after marriage. At the age of twenty-seven, married the second time. Has never been pregnant. About two years ago began to suffer with dysmenorrhœa. Leucorrhœa has also been a symptom of late. Three months ago, was seized with a severe pain in the hypogastric region, which confined her to bed two weeks. The pain was so intense that it could only be alleviated by large doses of opium internally, and the application of hot poultices to the abdomen. The period recurs regularly, but is scanty, and the dysmenorrhœa now gives rise to more suffering; bowels constipated; appetite poor.

"23*d*. Examined by Dr. Emmet, who diagnosticated a chronic perimetric inflammation.

"*March* 2. Patient left the hospital on account of domestic reasons.

"*January* 13, 1873. Readmitted into the hospital. She came now under my immediate care and observation, as the Assistant Surgeon on duty at the time; Dr. Emmet seeing her from time to time, according to the routine of the hospital, and giving me the benefit of his counsel and experience. The period is now more protracted and copious than formerly, and is attended with similar pains. Dr. Emmet's examination showed the existence of retroversion of the uterus with pseudo-membranous attachments to the rectum, the result of partial peritonitis. As part of the treatment, a pessary was introduced into the vagina, with the hope that by its lever-like action the pseudo-ligaments would be gradually stretched, and undergo atrophy, and the uterus ultimately be restored to its normal position. It was proven, however, that there existed so much tenderness in the posterior fornix vaginæ, that no pessary that could be placed *in situ* could be worn for any length of time, though the shape was modified repeatedly to meet the exigencies of the case.

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[1] Retro-uterine Hematocele, etc., by George T. Harrison, A.M., M.D., Assistant Surgeon to the Woman's Hospital of the State of New York; Virginia Medical Monthly, Oct. and Nov. 1875.

"31*st*. The last time the pessary was adjusted the patient suffered, for a few hours afterwards, a good deal of pain, and, according to instructions, she removed it. The tissues posterior to the uterus were so sensitive on pressure that the patient was ordered to keep her bed for several days, and to use repeated injections of hot water.

"*Feb.* 5. As the patient walked into the operating room, I was struck with her exceedingly pallid countenance and entire change of appearance since my last visit. She says that she has been feeling worse for the past few days, has now a bearing-down sensation in the pelvis, difficulty of defecation and urination; feels very weak and faint, though she has walked but a few steps, assisted by the nurse, her bed being in the adjacent ward but a short distance away. Examination per vaginam revealed the existence of a large globular elastic tumor, which has dislocated the uterus forwards against the symphysis pubis, and was just behind the portio-vaginalis, pressing the posterior fornix vaginæ downwards, and, as investigation per rectum showed, encroaching largely on the sacral cavity. Bimanual palpation demonstrated clearly that the tumor was distinct from the uterus and immediately posterior to it. There was no elevation of temperature or other evidence of fever. There had been no discharge of blood through the vagina, and it was not the time for the recurrence of the menstrual period. It should be remarked that the colon was found a day or two afterwards loaded with fecal matter, which was dislodged with difficulty by copious injections, and it is possible that this accumulation may have had some bearing upon the etiology of the trouble. The rapid manner in which the extravasated blood was absorbed in this case was very remarkable, and tended to confirm the truth of Voisin's statement that 'the tumor from the moment of its development shows the endeavor to diminish.'"

The history of this case is of interest, since the occurrence of the hematocele had no connection with the menstrual flow. After detailing the history of another case, Dr. Harrison summarizes in the following manner: "The fair and legitimate inference to be drawn from the clinical history of these two cases is, we think, that here was a primary closure of Douglas's cul-de-sac, and secondarily an effusion of blood into the closed space there formed; and that the partial pelvic peritonitis, recognized in each case prior to the development of the hematocele, not only furnishes the pseudo-membranes roofing the Douglas's space, but also gave origin to the hemorrhage in the way described by Dolbeau, Virchow, and Ferber."

CASE XIV.—Mrs. Van B., of Newark, aged 27, consulted me December 6, 1871. She menstruated for the first time at fifteen, after which she had been regular, and was in good health when married at eighteen years of age. One year afterwards she gave birth to her only child by a natural labor. Subsequently the period gradually became more painful throughout the first day, and increased in duration from five to eight days. For a long time she had had a profuse vaginal discharge for several days after the period had ceased. She had been able to walk and stand without difficulty, unless she had over-exerted herself, when there would come on a pain low down in the back. She had been married a second time five years, and sought advice for the increasing dysmenorrhœa and sterility.

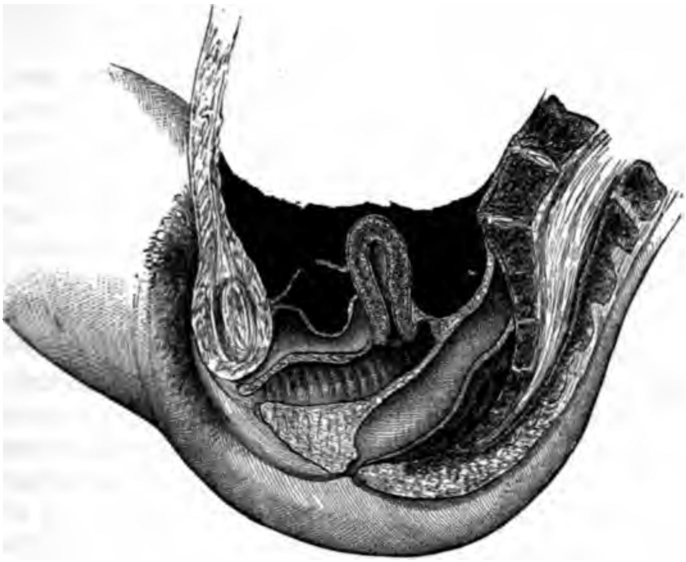
The uterus was found retroverted, with the cervix near the neck of the bladder, and the vagina extending beyond into a deep cul-de sac. A small mass, not larger than half an inch in diameter, was detected in front of the right broad ligament, just above the vaginal junction; in other words, it was in the angular space formed by the ligament, uterus, bladder, and vagina. This was supposed to be a fibroid, and that from its situation it would aid in causing retroversion of the uterus whenever the bladder became distended. The position of the uterus, and the deep vagina beyond, was thought to have been a sufficient cause for the sterility. The organ was replaced without difficulty, and a pessary was fitted to retain it in position. Within a week she became pregnant, when, without any known cause, she miscarried March 1, 1872, at nearly the completion of the third month.

23*d*. Without consulting her physician she made the journey, on an inclement day, to consult me in regard to a constant show which had continued since her miscarriage, for over three weeks. She was flowing very freely when I saw her in my office, which, together with the weather and her appearance as that of a very sick woman, made me think it best to retain her. She was placed on the elevator, taken up-stairs, and put to bed in my private hospital. For several days I tamponed the vagina, but it caused a great deal of irritation in the neighborhood of the supposed fibroid. This mass could not now be felt, but in its place there was a diffused thickening, apparently more in the vaginal wall than in the cellular tissue beyond. The uterine cavity was carefully explored, by means of my curette forceps, to determine as to the retention of some portion of the placenta, but there was nothing within the canal. She was kept in bed, and iodine was applied for several days with partial success. Large vaginal injections of hot water were administered night and morning, and they were apparently more efficacious in checking the flow than any other means employed. But the patient was both unreasonable and ungovernable, so that she would not submit to taking them through fear that the use of hot water might weaken her. On Monday, April 8, I found her so irritable and fault-finding, from the continuation of the show, that I asked Dr. T. G. Thomas to see her in consultation. He recommended the application of tannin to the uterine canal, made up with cocoa-butter into a proper shape. One of these cylinders I introduced at noon on the following day without difficulty, as she lay on the left side with the os uteri exposed from the use of the speculum. The table was then moved up alongside of her bed, so that she might roll carefully upon it, but instead of doing so she stood up and flounced herself down on the bed in so violent a manner that I remarked she ought to be ashamed of herself. There was no show after the use of the tannin, but, instead of being encouraged, the nurse informed me that she was more depressed than usual. At 8 P. M. she began to suffer from pain over the abdomen, and I directed a drachm of McMunn's elixir to be thrown into the rectum. But she began to vomit before it had any effect, but after receiving a hypodermic injection of morphine, and a poultice over the abdomen, she spent a quiet night. The temperature was 98.5°; the pulse 106, and weak. On the following morning, the pain and vomiting returned. I made a vaginal examination, detecting nothing unusual, that is, I found nothing in the posterior cul-de-sac, but I neglected to place my hand over the abdomen, as it was covered with a poultice. She was kept comparatively quiet during the day by injecting several times a drachm of chloroform, holding in solution an equal quantity of camphor, into the rectum. But it was most evident that she was sinking, and yet suffered but little if any pain. At 5 P. M. she began to show symptoms of collapse, with vomiting and more pain. Dr. Thomas saw her with me at 8 P. M., and on examining the abdomen the presence of a mass on the right side of the bladder was at once evident. He then suggested the existence of a hematocele, which had not occurred to me, from its being in so unusual a place. I had recognized the symptoms as characteristic of hematocele, but found nothing in the posterior cul-de-sac or broad ligaments; and I neglected to examine the abdomen. How many hours this accumulation had been sufficiently great to be prominent through the abdominal walls cannot be answered; it may have had its beginning at five o'clock. The pain gradually increased in severity so that no amount of morphine, either by rectum or under the skin, seemed to be of any benefit. About midnight she suddenly gave a most piercing scream, and, starting out of bed, wild with suffering, she exclaimed that her insides were being torn to pieces. In ten minutes the stamp of death was on her features, and yet, for six hours before she died, she seemed unable to remain quiet a single second, and, at last, she dropped dead from exhaustion.

On opening the abdomen the lower portion of the peritoneal cavity was found filled with a large clot which covered the pelvic organs.

Removing this clot carefully, it was found that the hemorrhage had commenced in the cellular tissue in front of the right broad ligament. It had lifted the peritoneum throughout from the anterior face of the broad ligament, partially from the side of the bladder, and entirely between the uterus and bladder. After this anterior fossa had become filled with blood, and had lifted the peritoneum, as has been described, rupture took place to the right of, and in a line with, the centre of the broad ligament. The blood then escaped into the peritoneal cavity and occupied about the relative space shown in Fig. 46.

Fig. 46.



Hematocele ruptured into the peritoneum.

The friends were so unwilling to permit an examination that a partial consent was only obtained at the last moment, by a threat of placing the case in the hands of the coroner. Unfortunately therefore we had neither the time nor the opportunity for removing the specimen or of even finding the ruptured vessel.

This form of thrombus or hematocele, when anterior to the uterus, is exceedingly rare, and I believe unique, in this locality, as I cannot find a similar case on record.

Differential Diagnosis.—Hematocele can scarcely be mistaken for any other condition except, under certain circumstances, that of extra-uterine pregnancy or cellulitis. It is scarcely necessary to refer to retroversion of the uterus, when enlarged from pregnancy or congestion, or to the presence of ascitic fluid, ovarian cyst, or a fibroid in Douglas's cul-de-sac. Neither of these conditions presents in common with hematocele such symptoms as could lead to any confusion if an ordinary amount of care is exercised in the examination.

A positive diagnosis, however, cannot always be made, by a single examination, for the existence of pregnancy is possible within the peritoneal cavity at the bottom of Douglas's cul-de-sac. And, moreover, if a rupture should have taken place, or if cellulitis should have been excited, the difficulties of a diagnosis would be increased. We will have to rely chiefly on the previous history of the case, as to the early signs of pregnancy. While in all probability a frequent show may have been noticed, there will have been no regular menstrual period, and the uterus will be found always larger than natural.

With tubal pregnancy the tumor will be found too well defined in shape, when compared to the condition resulting from an extravasation of blood between the folds of the broad ligaments; in this the blood tumor always becomes blended with the side of the uterus itself. In tubal pregnancy, however, the enlargement of the uterus and the frequent occurrence of a show, in the continued absence of the regular menstrual flow, will be found the most reliable symptoms.

During the formation of a hematocele there is never an elevation of temperature, as with cellulitis or peritonitis, but on the contrary the prominent features are those of depression. When an extravasation has taken place into the connective tissue, a finger in the vagina will only detect an irregular surface, due to the blood having met with more or less resistance in its course. On the other hand, when blood accumulates in Douglas's cul-de-sac, a smooth, rounded, and well-defined mass will characterize the shape of this pouch, when felt from the vagina. This outline becomes lost in the event of either cellulitis or peritonitis, while inflammation imparts a degree of density to these tissues, which is never felt in connection with a simple effusion of blood.

A rare form of hematocele has been described which might be mistaken for inflammation of the broad ligaments or general cellulitis, if merely a superficial examination were made. It is when the blood has been thrown out in such a quantity as to distend the fold of one broad ligament, and then, instead of rupturing into the peritoneum, it dissects this membrane from the sides of the uterus, so as to pass into the cellular tissue of the other broad ligament. This general extravasation may put the parts so much on the stretch as to simulate somewhat the condition caused by inflammation. If such an extent of tissue was involved by cellulitis, the symptoms would be so different from those which have been detailed for hematocele that there would be no difficulty in making a correct diagnosis.

Treatment.—But little more can be added to this portion of the subject beyond what has been already given in the histories of the cases detailed. Surgical interference has been advocated by many, and its practice has been urged as a necessary procedure at an early stage. Unquestionably cases must occur when the surgeon would be wanting in a sense of duty if he did not assume the responsibility and puncture the mass. But with a large majority of cases such an interference would be criminal, as it needlessly places the life of the patient in jeopardy.

As a rule, nature makes a prompt effort to repair, by absorption, the result of this accident, and, unquestionably, the lesion occurs and is often removed without its existence having been suspected. Absolute rest in the horizontal position is the first indication, and this must be maintained until all danger of a recurrence of the hemorrhage has passed. The application of an ice-bag to the abdomen and the use of ergot have been recommended, but I doubt the value of either remedy. It is not improbable that any good effect from the use of cold in arresting the hemorrhage would be more than counterbalanced by the risk of exciting inflammation. Ergot in small doses may exert some effect on the coats of the bloodvessels, if given hypodermically, while it would be apt to derange the stomach if taken internally.

I would trust more to a cool room, light bedclothing, absolute rest, and opium, if needed, with a moderately tight abdominal bandage. The tendency is to form a clot about the mouth of the bleeding vessel, which will do more than anything else to arrest the hemorrhage, if it is not disturbed. It will be prudent for the patient to remain quiet in bed during the approach of the next menstrual period, for fear of causing a recurrence of the hemorrhage.

As the rapidity with which the clot will be removed will depend upon the state of the general health, every effort must be made to improve it. The value of large and continued doses of iodide of potassium in producing absorption of the clot has yet to be tested by further observation. Should cellulitis occur, the complication must be met on general principles, as if it were the original affection. The continued use, however, of hot water vaginal injections will not only lessen the liability to this complication, but will hasten materially the absorption of the clot.

CHAPTER XIII.

DISEASE OF THE PELVIC CELLULAR TISSUE AND PELVIC PERITONEUM.

Description of the tissues—Views of different authorities regarding the tissues involved—The influence of cellulitis not fully appreciated as a cause of disease in the uterus and ovaries—Etiology—Tables showing the causes, complications, and location of cellulitis, and influence of cellulitis on the menstrual flow—Symptoms—Treatment—Dr. Brickell's views.

THROUGHOUT the pelvis, in the spaces between the bladder, uterus, and rectum above, and about the vagina and rectum below, is found the cellular or connective tissue, which serves the purpose of steadying the organs, and from its elastic character breaks, like a cushion, the force or jar which would otherwise be felt with every step. The bloodvessels and nerves pass through and are distributed by means of this tissue, which from its peculiar web- or sponge-like formation is well fitted for carrying them. It admits of a great degree of traction upward (as in pregnancy) or downward (as in prolapse) without impairment of the integrity of either the bloodvessels or nerves which it contains.

Above is the peritoneum, reflected from the abdominal wall in front, over the anterior and upper third of the bladder, to the body and fundus of the uterus. Then dipping posteriorly, an inch or more below the vaginal junction to form Douglas's cul-de-sac, it passes backward to cover the anterior face of the rectum. The peritoneum thus invests the organs of the pelvis, dipping down sufficiently on all sides to conform to the general outline of the upper portion of these organs. As it thus passes down between the organs and over the Fallopian tubes, it includes a certain amount of the cellular or connective tissue between its folds, and with this and a few muscular fibres forms the uterine ligaments. The broad ligament enfolds the Fallopian tube on each side of the uterus, and the utero-sacral ligaments behind are formed in the same manner between two folds of the peritoneum.

About the beginning of the second quarter of the present century, systematic investigations, for the first time, were instituted by certain

French observers into the nature of the inflammatory condition frequently found in the tissues of the female pelvis. But almost from the beginning, and to the present day, the greatest difference of opinion has existed in regard to the causes of the inflammation and more particularly as to the tissues involved. As the nomenclature is based upon theoretical views, or on a special class of cases, it is almost impossible, without some explanation, to accept any one term in common.

Marchal seemed to have only recognized the result of these inflammations by the term "phlegmonous intra-pelvic abscesses."

Nonat regarded the condition as a "peri-uterine phlegmon," one in which the peritoneum was not involved.

Bernutz and Goupil,[1] in their almost exhaustive treatise on pelviperitonitis, show conclusively, by post-mortem examinations, that the peritoneum is chiefly involved, at least in the class of cases which were under their observation. Bernutz claims that a tumor felt in close relation to the uterus is the result of peritoneal adhesions, and never of cellulitis. He, however, does acknowledge a special inflammation of the cellular tissue in the broad ligaments and of that about the rectum, but considers it merely a variety of phlegmon of the iliac fossa, in contradistinction to the peri-uterine phlegmon of his day, which was supposed to develop between the uterus and its peritoneal covering, and which he is not willing to admit.

Aran thought the small tumors felt from the vagina were the result of cellulitis, while the larger ones about the pelvis were formed by peritoneal adhesions.

West (*Lectures on the Diseases of Women*) termed the condition of pelvic inflammation an "acute purulent œdema," and considered pelvic peritonitis as a rare lesion.

Courty (*Maladies de l'Uterus, etc.*) uses the term "peri-uterine inflammation;" he states that none but small tumors have ever been found in the cellular tissue after death, and when of large size are always from peritonitis.

Virchow (*Archiv, etc.*, 1862) recommended the term "perimetritis," meaning inflammation of the pelvic peritoneum, and "parametritis," expressing inflammation of the cellular tissue about the uterus.

Dr. J. Matthews Duncan adopted the nomenclature of Virchow as the basis of his work on pelvic inflammations.

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[1] Clinical Memoirs on the Diseases of Women, translated by Alfred Meadows, M.D., New Sydenham Soc., 1868.

Dr. Graily Hewitt in his work (*The Diseases of Women*) uses the term pelvic cellulitis, and maintains (page 483): "The actual seat of the effusion is, in most cases, the meshes of the cellular tissue surrounding the uterus, between the folds of the broad ligament, and extending thence in various directions towards the pelvic walls; but it is probable that in some cases of pelvic inflammation there is an inflammatory condition of the peritoneum itself."

Dr. Barnes (*Clinical History of the Medical and Surgical Diseases of Women*) has shown that none of these terms can be taken to express the condition of pelvic inflammation under all circumstances. Yet he has done much to bring the views of different observers into harmony, as correct from different stand-points. He expresses very nearly my own views, that the different forms of inflammation in the pelvis are determined, to a great extent, by the circumstances or exciting causes.

Courty's term, "peri-uterine inflammation," expresses my views in connection with the puerperal state, when the disease extends from the uterus and appendages, but does not do so under other circumstances. The terms perimetritis and parametritis are not applicable, as they express a theoretical distinction only, since the difference cannot be recognized clinically. At least, I must acknowledge my own inability to make any distinction at the bedside. It is inconceivable that inflammation of any portion of the pelvic peritoneum can exist without involving the cellular tissue in relation with it. Nor is it possible that extensive cellular inflammation could run its course without extending to the peritoneal covering, which is in such close relation with it. We certainly cannot have extensive cellulitis without pelvic peritonitis, which, in some cases, may become general.

A general peritonitis may involve the pelvic peritoneum, although this is not usual; or local inflammation may be excited by the contact of solid or fluid materials escaping from the uterus or its appendages. Yet, whatever the exciting cause, pelvic peritonitis cannot exist alone, but must rapidly involve the cellular tissue in its vicinity.

I shall employ the term cellulitis as expressing the most common condition of pelvic inflammation in connection with the non-puerperal diseases of women. Pelvic peritonitis will not be treated of as a distinct lesion, but as the accident, rendering the case of general cellulitis the more grave in character from the complication.

I do not exaggerate when I claim that pelvic cellulitis is by far the most important one with which woman is afflicted. It is the most common, and becomes the more important, in being comparatively seldom recognized when limited in extent. It seems scarcely possible that any one with the slightest experience could overlook an extensive cellulitis, whether confined to one side, or general. At least the existence of some great pathological change ought to be detected under these circumstances, which of itself would be sufficient protection for the patient against any procedure likely to aggravate her condition. But I do not hesitate to make the assertion, as a truth based on my own knowledge, that many practitioners habitually neglect to recognize this condition, when circumscribed, or they do not appreciate its importance if by accident it be detected. Many of the disappointments and the bad results so often complained of in the management of the diseases of women, in general practice, may be attributed to the existence of unrecognized cellulitis. Its undetected presence may, to the end, thwart all treatment, or may gravely complicate the case by suddenly developing to a most serious extent. A great advance in the treatment of the diseases of women will be made whenever practitioners become so impressed with the significance of cellulitis as to apprehend its existence in every case. The successful operator in this branch of surgery will always be on the lookout for the existence of cellulitis, and take measures to guard against its occurrence.

When a patient is examined for the first time, the starting-point should be to determine the existence of cellulitis, and the slightest trace of it should be recognized. This is absolutely necessary before we can, with safety, proceed to the subsequent steps of the examination. When the finger is introduced into the vagina, it should be passed first to one side, and then to the other of the uterus, to detect any thickening in either broad ligament, which would indicate this disease. If the neck of the uterus were found drawn to one side of the vagina, this we would recognize as the effect of a former attack of cellulitis, which resulted in shortening of the ligament on that side. With one hand over the abdomen, and the index finger of the other in the vagina, it will be easy to judge of the extent of the thickening, or whether the disease is still smouldering, as it were, as evidenced by the pain produced on pressure. The posterior cul-de-sac must be afterward subjected to the same careful examination. The investigation is to be completed by introducing the finger into the rectum, which enables us to detect, from the tenderness excited on pressure, any local inflammation in the upper part of the broad ligament. The examination by the rectum should never be omitted, for extensive disease may exist in the upper part of the broad ligament along the course of the Fallopian tubes, or in the ovaries, which cannot be recognized from the vagina. During the course of the examination thus conducted, the position, size, and mobility of the uterus can be accurately appreciated.

Inflammation of the pelvic cellular tissue may exist in any degree from simply a point of tenderness, only to be detected on pressure, to a general cellulitis. The impression conveyed to the finger by the latter condition, would be as if the cellular tissue, while in a fluid state, had been poured into the pelvis about the organs, and, after filling every interstice, had become solid. When the inflammation has been confined chiefly to the peritoneum, and the cellular tissue in contact with it, the anterior wall of the vagina will become tense from the lateral traction exerted by the inflamed tissues. The sensation then conveyed to the finger will be as if a cardboard blocked up the pelvic canal, and the neck of the uterus will be felt fixed and as if presenting through an opening barely large enough for its passage. This condition represents inflammation of the pelvic roof involving the peritoneum throughout the pelvis in a plane extending from the sub-pubic ligament to the attachment of the utero-sacral ligaments at the sacrum. The most frequent site for cellulitis, when limited in extent, is under the posterior face of the broad ligament in close proximity to the cervix. It is most frequently found in the left broad ligament, or extending backward along the right utero-sacral ligament. Whenever a prolapse occurs, or a retroversion, the seat of greatest irritation must be near the attachment of the utero-sacral ligaments to the uterus, where the weight or traction is centralized. In case of injury to the cervix from childbirth, or from any surgical procedure, followed by inflammation, cellulitis readily occurs between the folds of the broad ligaments. This is easily explained from the fact that the cellular tissue becomes so blended with the tissues at the point of junction of the cervix and vagina, that from the contiguity it cannot escape being involved. The process of repair is usually more active in the cervix than it is in the neighboring cellular tissue, so that the products of inflammation are likely to remain long after the exciting cause has disappeared. It may then require but a slight provocation to light up, as it were, into a flame, a condition which, in all probability, had been unsuspected.

If thickening at any point can be detected, or an unusual amount of pain be elicited by pressure of the finger, it will be inadmissible to institute any surgical procedure, or to attempt to replace the uterus if it is retroverted, to introduce the sound, or to make any application within the uterine canal. We must first employ the necessary means for bringing about a normal condition of the circulation, and by having the case under careful observation, the proper course to be followed will be soon plainly indicated.

Very great advances have of late years been made in uterine pathology and therapeutics, but an intimate study of the pelvic cellular tissue in its normal and morbid states will bring to us a solution of many problems which still perplex us. Any departure from the normal in this tissue must of necessity affect the uterus and its appendages, for their blood, nerve, and lymph supply is received through it and must be influenced by any disturbance in it. This view has for a long time directed my practice, and although I may not be able to recognize that every form of uterine trouble is preceded, or accompanied by changes in the cellular tissue, yet I believe that future observation will show that those forms in which they are absent are relatively few. This idea is strongly supported by the action of hot water vaginal injections, which I hold to be essential in the treatment of all uterine diseases; for the hot water affects the uterus chiefly through its influence in giving tone to the vessels in the connective tissue.

ETIOLOGY OF PELVIC CELLULITIS.

It is generally held by modern writers that the occurrence of cellulitis is secondary to some exciting cause in the uterus, or to some disease in the Fallopian tubes or in the ovaries; and it has even been maintained that inflammation could not originate in the cellular tissue.

Dr. J. Matthews Duncan, the latest authority, who has specially written on this subject, expresses his views in the following manner:[1] "The theory on which I insist is that these inflammations are all secondary; that they are produced by inflammation of the uterus, or of the tubes, or of the ovaries, or by noxious discharges through or from the tubes and the ovaries, or by mechanical injury. Without one or other of these causes this inflammation and abscess is not observed. Of all of the prolific causes, inflammation of the mucous membrane of the womb is, in my opinion, the most common, and this both in the puerperal and non-puerperal states."

My convictions are that while the primary cause of uterine disease lies, through the influence of the sympathetic system, in impaired nutrition, we must look to pathological changes in the connective tissue as the immediate cause of the results we now regard as the original disease in the uterus and ovaries.

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[1] A Practical Treatise on Perimetritis and Parametritis, Edinburgh, 1869, p. 32.

These views have no reference to the lesions incident to the puerperal state, for there I recognize the direct susceptibility of the uterus to disease and mechanical injury. Pathological changes are then brought about in the connective tissue of the pelvis as secondary to the uterine condition, and may remain long after the original lesions have disappeared. But these pathological changes may afterwards so far effect the circulation, either mechanically or through the nervous system, as to become the cause of new and other forms of uterine disease.

In few other portions of the body, within the same extent of space, can be found the same number of bloodvessels or nerves as are distributed to the pelvic connective tissue. These vessels are doubled upon themselves to an almost incredible degree, and cannot be put on the stretch, or have their calibre lessened by the traction of pregnancy or uterine displacement. This provision is, however, a source of weakness should the local nutrition become impaired, since it permits a great portion of the blood contained in a woman's body to gravitate into the vessels and become sluggish.

It is unquestionably true that we may and do have metritis in the puerperal state exciting cellulitis, but I deny that we ever have inflammation of the uterine tissue under any other circumstances. I have never found pus in the uterine tissue, nor any other evidence of inflammation after death, in any form of uterine disease, except as a result of childbirth or malignant disease. I have never seen a case of ovaritis without inflammation of the neighboring tissues, and where I have had the opportunity of observing early enough, I have always detected the cellulitis before the ovary became involved. We have no means of judging with any accuracy as to the condition of the Fallopian tubes during life; but unless they have been directly poisoned by some foreign irritation, as by gonorrhœal discharge, the probabilties are that inflammation of their mucous membrane, as of that of the uterine canal, is secondary to some previous lesion in the cellular tissue. This view is not irrational, since the cellular tissue is much more abundantly supplied with bloodvessels and nerves than is the non-pregnant uterus. As we have seen, all the bloodvessels and nerves, which reach the uterus, pass through the pelvic cellular tissue; hence, this is the first and most exposed to influences exerted through the bloodvessels, and consequently it is the most liable to become inflamed.

To illustrate: the circulation in a portion of the cellular tissue may ecome obstructed from some cause, with the effect of producing conestive hypertrophy of the uterus by damming up the blood in its ssues. One of the first efforts of nature would be to relieve this ondition by an increase of secretion from the mucous follicles. As is discharge continued to flow, the epithelium of the surface most xposed to it would at length be abraded, and what has hitherto been rmed an ulceration would be produced. It has been the accepted ractice, even to the present time, to apply caustic remedies to such surface until the character of the tissue was destroyed, when, of ourse, the so-called ulcer would heal, the hypertrophy, which was e original condition, however, remaining unchanged. I hold it to e more rational to relieve first the obstruction to the circulation in e cellular tissue, after which the hypertrophy of the uterus will pidly diminish, the discharge will cease, and the so-called "ulceraon" heal without further care.

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The causes of inflammation of the pelvic tissues may be classed as uerperal and accidental.

It may be claimed that many of the injuries of childbirth are accental, and, to a certain extent, this is true, so far, at least, as regards e exciting cause. But the puerperal state is one in which the conective tissue and peritoneum are not only liable to injury from presure and from laceration, but to inflammation extending from the veins f the uterus to those in the connective tissue. From the great inease in vascularity of the parts, the woman is then the more liable , and the less able to resist, the effects of local injury, which, in the on-puerperal state, would be productive of but little disturbance.

I am deeply impressed with the belief that future observation will tablish the fact that the point of origin of inflammation in the pelvic llular tissue is in the veins. We have yet to learn the determining ement which in one instance will limit the inflammation, and in an her will cause also the cellular tissue to be involved. The connective sue, of course, becomes more or less involved in every case of phleitis, but when it is general in extent the condition is more decided, nd is accompanied by intense arterial congestion. That phlebitis in e pelvic cellular tissue does arise in the puerperal state, was taught y Trousseau, and I have verified it in the earlier part of my professional life, when my opportunities were better for studying pathological changes; but it must be left to future observation to determine why and how it occurs in the non-puerperal condition, for I have had no opportunity of establishing this point.

But a very moderate amount of experience would be sufficient to impress any observer with a belief in the existence of a marked difference in the forms of cellulitis, a difference which cannot be dependent on either locality or changes in the general condition. A most extensive phlegmonous cellulitis may be detected after childbirth, which will sometimes rapidly disappear within the course of a few days, and we frequently meet with like cases in the non-puerperal state. On the other hand, a less severe inflammation, following a lacerated cervix, for instance, may last for years, and the same condition may result from exposure to cold. It is in consequence of these great differences that I am impressed with the belief that the immediate exciting causes of the inflammation cannot be the same under all circumstances. We may have the most extensive inflammation rapidly disappearing, coincident with, or as consequent upon, a certain course of treatment. Yet, in a similar case, or with the patient in even better general health, the local condition will remain for months or years unchanged. We have yet to ascertain what the predisposing condition is, since the most insignificant exciting cause may, in some instances, be followed by the most disastrous results, and in others be absolutely without bad effects. A low grade of phlebitis, it is believed, may remain for an indefinite period, and its existence in the cellular tissue is the most rational explanation which can be offered for the occurrence of these sudden complications.

We shall consider briefly the statistical history of some three hundred and three cases of cellulitis, of which the histories are complete, and who were treated in my private hospital.

The average age of puberty was 14.02 years, and that of marriage, for the fruitful women, was 19.84, and they are both almost identically the same as was obtained for the general averages. But the average age of marriage for the sterile women was 22.88 years, which is nearly three years later in life than the general average on all women. The average number of children was but 1.36, and, including the miscarriages, we have but an average of 2.15 pregnancies for each woman. Both of these averages are much below those obtained on the total number of all women under observation. This is certainly an indication of the fact that cellulitis is a cause of sterility, and this is corroborated by the average length of time since the last pregnancy, which was found to have been 6.69 years. The average age at the time of the first consultation was 29.44 years for the fruitful, 31.43 years for the sterile, and 27.38 years for the unmarried women. This would show that the average age for the fruitful, at the termination of the last pregnancy, was 22.75 years.

Of the total number of cases of cellulitis under observation, 157, or 51.81 per cent., had no uterine or ovarian disease which could be detected. If any form of these diseases had been the exciting cause of the cellulitis, all traces had disappeared, so as to leave only the product. The remaining 156 cases suffered from other lesions in addition to the cellulitis. The supposed causes of the cellulitis will be given as reported by those patients where no uterine disease could be detected when first examined.

TABLE XIV.—*Supposed Causes of Cellulitis, uncomplicated with other local disease.*

Causes.	Unmarried.	Sterile.	Fruitful.	Total.	Percentage.
Married life	......	14	......	14	8.91
Childbirth	......	......	21	21	13.37
Miscarriage	......	......	11	11	7.00
Criminal abortion . . .	......	......	11	11	7.00
Exposure to cold	11	6	2	19	11.79
Excessive study	1	1	......	2	1.21
Falling down stairs . . .	5	1	1	7	4.45
Sewing machine	1	1	......	2	1.21
Sudden fright	1	1	......	2	1.21
Unknown causes	17	30	21	68	43.64
Total	36	54	67	157	
Percentage . . .	22.93	34.39	42.67	51.81	

The first feature presenting itself in Table XIV., in regard to the liability to the disease, is that the proportion of unmarried and sterile women is greater, and that of the fruitful women is nearly fourteen per cent. less than the general average for all women under observation. The greater number of the unmarried women traced their diseases to exposure and imprudence in dress, and the proportion I do not believe is over-estimated. Almost as large a percentage of sterile women attributed their bad health to the marriage state, in other words they suffered the penalty for violating, in some manner, the laws of nature. Nearly all the fruitful women had suffered since the termination of pregnancy. It is a melancholy fact, as shown, that of forty-six women who suffered from cellulitis, and could assign tissue as the immediate cause of the results we now regard as the original disease in the uterus and ovaries.

These views have no reference to the lesions incident to the puerperal state, for there I recognize the direct susceptibility of the uterus to disease and mechanical injury. Pathological changes are then brought about in the connective tissue of the pelvis as secondary to the uterine condition, and may remain long after the original lesions have disappeared. But these pathological changes may afterwards so far effect the circulation, either mechanically or through the nervous system, as to become the cause of new and other forms of uterine disease.

In few other portions of the body, within the same extent of space, can be found the same number of bloodvessels or nerves as are distributed to the pelvic connective tissue. These vessels are doubled upon themselves to an almost incredible degree, and cannot be put on the stretch, or have their calibre lessened by the traction of pregnancy or uterine displacement. This provision is, however, a source of weakness should the local nutrition become impaired, since it permits a great portion of the blood contained in a woman's body to gravitate into the vessels and become sluggish.

It is unquestionably true that we may and do have metritis in the puerperal state exciting cellulitis, but I deny that we ever have inflammation of the uterine tissue under any other circumstances. I have never found pus in the uterine tissue, nor any other evidence of inflammation after death, in any form of uterine disease, except as a result of childbirth or malignant disease. I have never seen a case of ovaritis without inflammation of the neighboring tissues, and where I have had the opportunity of observing early enough, I have always detected the cellulitis before the ovary became involved. We have no means of judging with any accuracy as to the condition of the Fallopian tubes during life; but unless they have been directly poisoned by some foreign irritation, as by gonorrhœal discharge, the probabilties are that inflammation of their mucous membrane, as of that of the uterine canal, is secondary to some previous lesion in the cellular tissue. This view is not irrational, since the cellular tissue is much more abundantly supplied with bloodvessels and nerves than is the non-pregnant uterus. As we have seen, all the bloodvessels and nerves, which reach the uterus, pass through the pelvic cellular tissue; hence, this is the first and most exposed to influences exerted through the bloodvessels, and consequently it is the most liable to become inflamed.

To illustrate: the circulation in a portion of the cellular tissue may become obstructed from some cause, with the effect of producing congestive hypertrophy of the uterus by damming up the blood in its tissues. One of the first efforts of nature would be to relieve this condition by an increase of secretion from the mucous follicles. As this discharge continued to flow, the epithelium of the surface most exposed to it would at length be abraded, and what has hitherto been termed an ulceration would be produced. It has been the accepted practice, even to the present time, to apply caustic remedies to such a surface until the character of the tissue was destroyed, when, of course, the so-called ulcer would heal, the hypertrophy, which was the original condition, however, remaining unchanged. I hold it to be more rational to relieve first the obstruction to the circulation in the cellular tissue, after which the hypertrophy of the uterus will rapidly diminish, the discharge will cease, and the so-called "ulceration" heal without further care.

An elaboration of these views might have been more in place while we were considering the general principles of treatment, but they have been presented intentionally in this connection, that they may be the more forcibly impressed.

The causes of inflammation of the pelvic tissues may be classed as puerperal and accidental.

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I am deeply impressed with the belief that future observation will establish the fact that the point of origin of inflammation in the pelvic cellular tissue is in the veins. We have yet to learn the determining element which in one instance will limit the inflammation, and in another will cause also the cellular tissue to be involved. The connective tissue, of course, becomes more or less involved in every case of phlebitis, but when it is general in extent the condition is more decided, and is accompanied by intense arterial congestion. That phlebitis in the pelvic cellular tissue does arise in the puerperal state, was taught by Trousseau, and I have verified it in the earlier part of my professional life, when my opportunities were better for studying pathological changes; but it must be left to future observation to determine why and how it occurs in the non-puerperal condition, for I have had no opportunity of establishing this point.

But a very moderate amount of experience would be sufficient to impress any observer with a belief in the existence of a marked difference in the forms of cellulitis, a difference which cannot be dependent on either locality or changes in the general condition. A most extensive phlegmonous cellulitis may be detected after childbirth, which will sometimes rapidly disappear within the course of a few days, and we frequently meet with like cases in the non-puerperal state. On the other hand, a less severe inflammation, following a lacerated cervix, for instance, may last for years, and the same condition may result from exposure to cold. It is in consequence of these great differences that I am impressed with the belief that the immediate exciting causes of the inflammation cannot be the same under all circumstances. We may have the most extensive inflammation rapidly disappearing, coincident with, or as consequent upon, a certain course of treatment. Yet, in a similar case, or with the patient in even better general health, the local condition will remain for months or years unchanged. We have yet to ascertain what the predisposing condition is, since the most insignificant exciting cause may, in some instances, be followed by the most disastrous results, and in others be absolutely without bad effects. A low grade of phlebitis, it is believed, may remain for an indefinite period, and its existence in the cellular tissue is the most rational explanation which can be offered for the occurrence of these sudden complications.

We shall consider briefly the statistical history of some three hundred and three cases of cellulitis, of which the histories are complete, and who were treated in my private hospital.

The average age of puberty was 14.02 years, and that of marriage, for the fruitful women, was 19.84, and they are both almost identically the same as was obtained for the general averages. But the average age of marriage for the sterile women was 22.88 years, which is nearly three years later in life than the general average on all women. The average number of children was but 1.36, and, including the miscarriages, we have but an average of 2.15 pregnancies for each woman. Both of these averages are much below those obtained on the total number of all women under observation. This is certainly an indication of the fact that cellulitis is a cause of sterility, and this is corroborated by the average length of time since the last pregnancy, which was found to have been 6.69 years. The average age at the time of the first consultation was 29.44 years for the fruitful, 31.43 years for the sterile, and 27.38 years for the unmarried women. This would show that the average age for the fruitful, at the termination of the last pregnancy, was 22.75 years.

Of the total number of cases of cellulitis under observation, 157, or 51.81 per cent., had no uterine or ovarian disease which could be detected. If any form of these diseases had been the exciting cause of the cellulitis, all traces had disappeared, so as to leave only the product. The remaining 156 cases suffered from other lesions in addition to the cellulitis. The supposed causes of the cellulitis will be given as reported by those patients where no uterine disease could be detected when first examined.

TABLE XIV.—*Supposed Causes of Cellulitis, uncomplicated with other local disease.*

Causes.	Unmarried.	Sterile.	Fruitful.	Total.	Percentage.
Married life	......	14	......	14	8.91
Childbirth	......	......	21	21	13.37
Miscarriage	......	......	11	11	7.00
Criminal abortion . . .	......	......	11	11	7.00
Exposure to cold	11	6	2	19	11.79
Excessive study	1	1	......	2	1.21
Falling down stairs . . .	5	1	1	7	4.45
Sewing machine	1	1	......	2	1.21
Sudden fright	1	1	......	2	1.21
Unknown causes	17	30	21	68	43.64
Total	36	54	67	157	
Percentage . . .	22.93	34.39	42.67	51.81	

The first feature presenting itself in Table XIV., in regard to the liability to the disease, is that the proportion of unmarried and sterile women is greater, and that of the fruitful women is nearly fourteen per cent. less than the general average for all women under observation. The greater number of the unmarried women traced their diseases to exposure and imprudence in dress, and the proportion I do not believe is over-estimated. Almost as large a percentage of sterile women attributed their bad health to the marriage state, in other words they suffered the penalty for violating, in some manner, the laws of nature. Nearly all the fruitful women had suffered since the termination of pregnancy. It is a melancholy fact, as shown, that of forty-six women who suffered from cellulitis, and could assign a cause, over twenty-three per cent. acknowledged to have undergone criminal abortion. This percentage, I believe, would be much under the actual proportion were we able to designate the "unknown causes." The same would be applicable to the sterile women, in so many of whom cellulitis was excited in consequence of their having employed some means to prevent conception. To the use of the sewing machine, as one of the causes, I am satisfied too small a proportion has been attributed. This instrument is in such general use, and so little regard is paid to the importance of not using it during the menstrual period, that we cannot over-estimate its injurious effects. It should be used with the greatest judgment by the most robust women; for the delicate no more certain means could be devised for producing disease.

Another factor in causing cellulitis, viz., that of rupture of blood-vessels, as with hematocele, does not appear in the record, since the patient would be ignorant of the occurrence. Yet, a very superficial study of the circulation through the pelvis, even in health, would be sufficient to convince any one that this accident cannot be a rare one. Extra-uterine pregnancy, rupture of cysts, and the escape of any foreign body into the peritoneal cavity, are all capable of producing pelvic peritonitis and general cellulitis. But this has been already referred to in the chapter on hematocele. Dr. West estimates that seventy-seven per cent. of all peri-uterine inflammations result from labors or abortions. Gallard and Bernutz place the proportion from these causes at forty-four per cent. A mean taken on these authorities would place the average at sixty per cent., which, as Courty states, is very near the fifty-five per cent. found by Aran as the proportion of frequency of pelvic adhesions as recognized by him in post-mortem examinations, where death had resulted from different causes.

In Table XV. are presented the different diseases which were found in complication with cellulitis. Displacements of the uterus form over fifty-four per cent. of the lesions found to be accompanied with cellulitis. The next most important accompaniment was laceration of the cervix, which, by extending into the connective tissue of the pelvis during child birth, readily produced cellulitis. The result was one which often follows laceration, the patient being liable for a long time after the reception of the injury to fresh attacks of cellulitis, which may come on from the slightest provocation. The product of this inflammation, or the condition remaining after an attack, is generally situated in the broad ligament, on the same side on which the laceration occurred through the cervix. Its presence there is seldom recognized, in consequence of an incomplete examination. It is to be noted, also, that it may be readily set up by an unskilful examination, by dragging down the uterus, or on using any other undue violence.

TABLE XV.—*Different Diseases in Complication with Cellulitis.*

Cellulitis with other diseases.	Unmarried.	Sterile.	Fruitful.	Total.	Percentage.
Versions	3	17	25	45	30.82
Flexures	2	20	10	32	22.59
Laceration of the cervix .	......	......	26	26	17.80
Fibroids	......	5	11	16	10.96
Hæmatocele	......	2	3	5	3.42
Early atrophy of the uterus	4	1	......	5	3.42
Prolapse of the ovary . .	1	3	......	4	2.73
Contraction of the os uteri	1	1	1	3	2.05
Ovarian tumor	1	......	1	2	1.36
Fibrous tumor	......	2	......	2	1.36
Fibro-cyst	......	......	1	1	.68
Rectocele	......	......	1	1	.68
Procidentia	......	......	1	1	.68
Lacer'n of the sphincter ani	......	......	1	1	.68
Cystitis	1	......	......	1	.68
Change of life	1	......	......	1	.68
Total	14	51	81	146	
Percentage . . .	9.58	34.93	55.02	48.18	

By Table XVI. is shown the relative frequency of location of the cellulitis, with the changes in the length and quantity of the menstrual flow. The record is perfect so far as relates to the cases of uncomplicated cellulitis, but the location was not noted where the disease was associated with other lesions. The more frequent occurrence of cellulitis on the left side is particularly remarkable. Of one hundred and fifty-seven cases of uncomplicated cellulitis, forty-one per cent. occurred on the left side, and only ten per cent. on the right side. General cellulitis was next in frequency of occurrence; then, in order, followed inflammàtion behind the uterus, and lastly, on the right side, and pelvic abscesses, which were found to be of the same relative frequency. There is but little to be noted as to the relative frequency of cellulitis in any special locality, according to the conditions of life, unless the result of accident. But under the head of pelvic abscess we find that of seventeen cases only one occurred among the unmarried, a proportion too small to have been accidental.

For the purpose of showing the changes in menstruation, the usual form has been followed in the table. Two divisions are first made, showing that one hundred and eighty-nine cases remained, after the

TABLE XVI.—*Menstruation as affected by Cellulitis.*

Location of the cellulitis. (Uncomplicated.)	PERIOD REMAINED UNCHANGED AS TO TIME AND QUANTITY, BEING FROM THE BEGINNING, EITHER										LENGTH OF PERIOD REMAINED UNCHANGED, BUT THE QUANTITY BECAME AFTERWARDS, EITHER												LENGTH OF PERIOD BECAME PROLONGED, WITH THE QUANTITY, EITHER									
	Normal			Too free			or Scanty.				Increased			Lessened			or Irregular.						Increased			Lessened			or Irregular.			
	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Total.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Total.	Number.	Per cent.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Total.
General	...	1	4	1	...	...	2	...	...	8	2	...	1	...	...	1	2	...	1	7	15	15.62	3	1	2	...	...	...	...	...	2	8
Behind the uterus	1	3	1	...	...	...	...	...	...	5	1	1	1	1	2	2	...	1	1	10	15	15.62	...	1	2	...	...	...	...	...	1	4
Left broad ligament	1	3	5	1	3	...	1	2	3	19	2	4	4	2	4	2	...	3	2	23	42	43.75	2	3	2	...	...	...	...	...	...	7
Right broad ligament	1	...	1	...	1	...	1	2	...	6	2	...	1	...	1	2	...	...	...	6	12	12.47	...	...	1	...	...	..	...	...	...	1
Pelvic abscess, locality not given	..	1	2	...	...	...	..	..	...	3	...	1	1	1	1	3	...	2	...	9	12	12.47	...	...	..	...	...	...	...	...	...	...
Total	3	8	13	2	4	...	4	4	3	41	7	6	8	4	8	10	2	6	4	55	96	....	5	5	7	...	...	...	...	...	3	20
Percentage	24 16.32			6 4.08			11 7.48			.... 27.89	21 14.28			22 14.96			12 8.16			.... 37.41	....	.... 65.30	17 11.56			....			3 2.04			.... 18.60
Cellulitis complicated with other diseases. Total	3	8	19	...	1	4	1	4	3	43	1	7	21	2	7	6	...	1	5	50	93	....	...	9	7	...	1	2	...	1	1	21
Cellulitis complicated with other diseases. Percentage	30 21.27			5 3.54			8 5.67			.... 30.49	29 20.56			15 10.63			6 4.25			.... 35.47	....	.... 65.24	16 11.34			3 2.12			2 1.41			.... 14.89
Total number of all cases	6	11	32	2	5	4	5	8	6	84	8	13	29	6	15	16	2	7	9	105	189	....	5	14	14	...	1	2	...	1	4	41
Percentage	54 18.75			11 3.81			19 6.59			.... 29.16	50 17.36			37 12.84			18 6.25			.... 36.45	.... 65.62	....	33 11.45			3 1.04			5 1.75			.... 14.23

TABLE XVI.—*Continued.*

Location of the cellulitis. (Uncomplicated.)	Length of Period became Lessened with the Quantity, either										Total with both time and quantity changed.		Change of life had taken place previous to the attack.				Summary.						Total number and percentage.	
	Lessened			Increased			or Irregular.										Single.		Sterile.		Fruitful.			
	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Single.	Sterile.	Fruitful.	Total.	Number.	Per cent.	Single.	Sterile.	Fruitful.	Total.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
General	1	4	2	...	...	1	...	...	2	10	18	35.29	....	2	3	5	11	30.55	8	14.63	19	28.25	38	21.20
Behind the uterus	...	...	...	...	...	...	...	...	...	....	4	7.84	1	1	....	2	4	11.11	9	16.63	8	11.94	21	13.37
Left broad ligament	3	3	5	2	1	...	...	...	1	15	22	43.13	....	1	....	1	14	38.58	27	50.00	24	35.82	65	41.40
Right broad ligament	2	...	1	...	...	...	...	...	...	3	4	7.84	....	....	....	....	6	16.66	4	7.40	6	8.95	16	10.19
Pelvic abscess, locality not given	...	1	2	...	...	...	...	...	...	3	3	5.88	....	....	2	2	1	2 77	6	11.11	10	14.92	17	10.82
Total	6	8	10	2	1	1	...	...	3	31	51	....	1	4	5	10	36	....	54	....	67	....	157	
Percentage	24 16.33			4 2.72			3 2.04			.... 21.08	....	.... 34.69	10			.... 6.36	....	... 22.93	....	.... 34.39	....	.... 42.67	....	51.81
Cellulitis complicated with other diseases. Total	2	11	10	...	...	2	2	...	...	27	48	....	3	1	1	5	14	....	51	....	81	....	146	
Percentage	23 16.31			2 2.72			2 1.41			.... 19.14	....	... 33.97	5			.... 3.42	....	.... 9.58	....	.... 34.93	....	.... 55.47	....	48.18
Total number of all cases	8	19	20	2	1	3	2	...	3	58	99	....	4	5	6	15	50	....	105	....	148	....	303	
Percentage	47 16.31			6 2.08			5 1.73			.... 20.13	....	.... 34.37	15			.... 4.95	....	.... 16.50	....	.... 34.65	....	.... 48.84		

cellulitis, unchanged as to the length of the flow. With ninety-nine cases, forming the second group, both time and quantity became changed. Eighty-four of those forming the first division, representing 29.16 per cent. of the total, underwent no change either as to time or quantity. The menstrual flow remained the same as it was before the attack of cellulitis, whether normal, too free, or scanty. We must, however, acknowledge our ignorance of the causes which, under apparently similar circumstances, determine changes in the quantity of the menstrual flow after an attack of cellulitis. Whatever these are, it is manifest, from the remarkable uniformity in the percentages, whether taken on the uncomplicated or complicated cases, that they are influenced by the character of the cellulitis.

Table XVII.—*Condition of the Menstrual Flow after Cellulitis.*

Condition of the menstrual flow after cellulitis.	Uncomplicated.		Complicated.		Total.	
	Cases.	Per cent.	Cases.	Per cent.	Cases.	Per cent.
Normal	24	16.32	30	21.27	54	18.75
Too free, or increased	48	32.64	52	36.87	100	34.72
Scanty	11	7.48	8	5.67	19	6.59
Lessened	46	31.29	41	29.07	87	30.20
Irregular	18	12.24	10	7.09	28	9.92
Total	147	....	141	....	288	....

A glance at Table XVII. will show the menstrual changes in quantity, without regard to the length of the flow. A comparison is given, at the same time, as to the relative frequency of these changes between the uncomplicated cases of cellulitis and those which were complicated with other diseases. It is shown that the quantity remained normal with 18.75 per cent., while the flow in a larger proportion of cases (but in nearly equal numbers), in comparison with each other, became either increased or lessened. The apparent discrepancy between the total numbers, as shown in Tables III. and IV., is due to the fact, that in the latter, fifteen cases of cellulitis, occurring after the change of life, are not included.

As a proof of the assertion that cellulitis is sometimes due to uterine or ovarian disease existing during the menstrual life, it has been held by different authorities that it does not occur after the change of life. I have, in consultation, met with two cases of cellulitis in children between eight and ten years of age, and before any evidence of approaching puberty existed. My private hospital records show that I have had under my care fifteen cases of cellulitis occurring after the change of life. All of these were between forty-five and fifty-five years of age; with the most recent case the menstrual flow had ceased eleven months previous to the attack, and in the other extreme an interval of seven hours had elapsed. The number I have given constitute about five per cent. on the total of all cases of uncomplicated cellulitis passing under my observation. The lesion is, beyond question, a rare one after the change of life, in consequence of the difference in the character of the tissues, and because the quantity of blood going to the parts then becomes reduced to just what is necessary for nutrition. But there is certainly no ground on which to base a theory of immunity after the menopause, since every portion of the human body may, under favorable circumstances, become inflamed. Two of these cases I treated for pelvic abscess; one had previously suffered for several years from senile vaginitis, and the other had married a second time, and late in life, a man much younger than herself. These patients were unable to give any explanation for the cellulitis, but I noted these circumstances at the time, as indicating, in all probability, the exciting causes.

Symptoms of Pelvic Cellulitis.—An attack of cellulitis is generally ushered in by a chill of more or less severity, followed by fever. But, at times, the attack begins with pain and fever without any perceptible chill. Again, extensive cellulitis is occasionally detected by accident, after having become already well advanced without causing any particular disturbance. Fever and pain about the lower portion of the abdomen are, however, the usual symptoms. The pulse will become greatly increased in rapidity, and the thermometer, if placed in either the axilla or mouth, will indicate a marked elevation in temperature. As the temperature is usually at least one degree higher in the vagina, during an attack of local inflammation, it is better for the sake of greater accuracy to make the observation in the vagina. Unless the inflammation is very extensive, so as to involve the peritoneum, the symptoms are not always well marked, nor do they follow closely any rule.

If the attack is a severe one, there will be tenderness over the lower portion of the abdomen on either side, or over the whole surface. The abdomen will be found tympanitic and intolerant to pressure, while the patient will lie on her back with the knees well drawn up, and unable to extend them without increasing the pain. These symptoms are found accompanying an attack of hysteria, and this disturb-approaching puberty existed. My private hospital records show that I have had under my care fifteen cases of cellulitis occurring after the change of life. All of these were between forty-five and fifty-five years of age; with the most recent case the menstrual flow had ceased eleven months previous to the attack, and in the other extreme an interval of seven hours had elapsed. The number I have given constitute about five per cent. on the total of all cases of uncomplicated cellulitis passing under my observation. The lesion is, beyond question, a rare one after the change of life, in consequence of the difference in the character of the tissues, and because the quantity of blood going to the parts then becomes reduced to just what is necessary for nutrition. But there is certainly no ground on which to base a theory of immunity after the menopause, since every portion of the human body may, under favorable circumstances, become inflamed. Two of these cases I treated for pelvic abscess; one had previously suffered for several years from senile vaginitis, and the other had married a second time, and late in life, a man much younger than herself. These patients were unable to give any explanation for the cellulitis, but I noted these circumstances at the time, as indicating, in all probability, the exciting causes.

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Nausea may exist early in the disease, but vomiting, with the ejection of bile in large quantities, indicates a serious extent of the disease, and general peritonitis. As the cellulitis becomes overshadowed by the extension of the peritonitis, the extent of the latter will be indicated by the expression of the patient's face, and by the tone of her voice. The features will become more pinched, and the voice will resemble closely that characteristic of the collapse of cholera. When the peritonitis has been unusually rapid in its progress, it seems to sear its way as does the white heat of a cautery, and to destroy sensation. I have seen such inflammations begin as a cellulitis, extend to the peritoneum, and, becoming general, run their course in a few hours, without the slightest local suffering or even pain on pressure. From the shock and rapid depression to the life force, the temperature will fall even below the normal standard, while the pulse will rapidly increase, since the heart, from a loss of power, is now obliged to make a greater number of contractions. That the temperature should go down as the pulse increased in frequency is apparently an anomaly. The rule is, however, as applicable to all conditions of rapidly failing power. The explanation lies, at the beginning, in imperfect aëration of the blood in the lungs, from which the capillary circulation becomes diminished in proportion as the needed stimulus of oxygen is deficient. A depression in temperature on the surface would naturally follow, while the heart, although enfeebled, must increase its frequency of action to get rid of the accumulation of blood. Experience has taught me that, in any acute disorder, it is the beginning of death when the temperature of the body falls below a point which is disproportionate to the extent of the disease, the pulse, at the same time, becoming rapid and equally out of proportion. In such cases of peritonitis this is an infallible indication of the beginning of the end, notwithstanding the strength of the patient may yet seem fair, and other grave symptoms be absent.

In other cases, after a certain interval, there will be a remission of fever, but never a marked intermission until the commencement of resolution or convalescence. The pyrexia will continue above the normal point in the vagina, although the heat of the skin may seem natural, while, towards the close of the day, there will always be a perceptible rise in the general temperature. The symptoms will all be marked just in proportion to the extent of the peritoneum involved, and, in extreme cases, the pelvic condition may be masked entirely by the symptoms of general peritonitis. In fact, without the aid of a digital examination, the extent of the cellulitis would remain unknown.

The first shock of the disease is spent on the nervous system, whether the exciting cause be blood-poisoning, extension of the inflammation over a greater area, or the sudden occurrence of cellulitis itself. We can only recognize the result of the shock by the chill, during which the blood flows from the surface to the internal organs, producing intense pelvic congestion. Nature's first effort to relieve this will be by the escape of the watery portions of the blood through the coats of these vessels, and the tissues become infiltrated with serum. Then reaction comes on, by which the circulation is partially restored, and the fever correspondingly subsides. If the finger be now introduced into the vagina, no hardening of the tissues will be detected, but the sensation of a fulness and a boggy feeling will be appreciated, and there will be a marked elevation of temperature.

As the disease advances, so as to involve the peritoneum, the uterus becomes fixed in its position, and the roof of the pelvis tightened, as I have described. With this process, plastic lymph is thrown out, opposing sides of the peritoneum adhere and inclose the inflammatory products. Then the finger in the vagina will be able to detect roughened surfaces, as if hard masses of some foreign substance had become inclosed within the pelvic tissues.

When reaction occurs, if the circumstances are favorable, the œdema of the tissues rapidly disappears, and these hard masses melt away, as it were. The uterus soon becomes again movable, and the only product of the inflammation remaining afterwards will be a band formed from the shrinkage of the tissues which had been involved. Should the uterus or the intestines be bound down by adhesions, the former can be replaced by art, and the peristaltic action will in time liberate the latter. But the damage will be almost irreparable whenever the ovaries have been involved, or the broad ligaments, if of sufficient extent to include the Fallopian tubes. As the ovaries are stationary, they will remain buried in the lymph, which has been thrown out, and when this begins to undergo contraction, the supply of blood is diminished so that they may become atrophied. Nerve-filaments are often involved in the mass and are compressed by the contraction, with the effect of causing ovarian neuralgia or reflex irritation elsewhere. To attacks of cellulitis, which may have produced but little disturbance at the time, can be traced the chief causes of sterility. The ovary may become covered in by a mass of lymph, as has been stated, so that the ova cannot escape from the Graafian follicles. The fimbriated extremity of the Fallopian tube may have been bound down or so displaced by adhesion, as to be no longer able to grasp the ovary for the purpose of receiving the ovum as it escapes from the ovarian stroma. Or, some portion of the Fallopian tube may become obliterated by a band of adhesion. Moreover, these consequences are by no means dependent upon the apparent gravity of the attack.

After subsidence of the attack, if nature, alone or aided by art, be unable to remove the products of the inflammation, symptoms of blood-poisoning present themselves, in consequence of the absorption of septic material into the general circulation, as if it were nature's last effort to restore the integrity of the parts. The patient now suffers from rigors, followed by fever; and there is but a slight remission of these symptoms at any time in the day. The encysted lymph and serum break down into pus, which, infiltrating the neighboring tissues, acts as a foreign substance, and sets up a fresh inflammation, causing their degeneration. A number of small accumulations of pus thus formed, at length coalesce into one or more large abscesses. These accumulations of pus extend in the direction presenting the least resistance, and generally empty themselves unaided. The most frequent point of escape is into the posterior cul-de-sac of the vagina, or, if from either broad ligament, a little to one side and posterior to the cervix. These abscesses rupture almost as often into the rectum, and with less frequency into the bladder. Occasionally the contents of an abscess may escape into the small intestines, in consequence of some adhesion, or it may follow the course of the psoas muscle, and open at the groin. It is the least likely to rupture into the peritoneal cavity, since it requires so little irritation to produce adhesive inflammation of this membrane that it would be protected in advance. Should this accident occur, the shock would be necessarily great, fresh inflammation would be excited, and there could be no safety for the patient unless it proved the means by which the pus could again become encysted.

In rare instances, the pus may pass from the pelvis through either sciatic foramen, and burrow under the glutei muscles, or in the neighborhood of the hip-joint. In many instances the escape of pus will continue only for a limited time, and, as the point of rupture is generally at the most dependent portion, the abscess is kept empty, its cavity shrinks, the walls adhere, and the discharge gradually ceases.

The symptoms of blood poisoning rapidly disappear, and the restoration to health is unobstructed.

Under other circumstances, the hectic fever and blood poisoning increase, and the discharge becomes more abundant. This occurs when the walls of the abscess happen to be so thick that they cannot be brought into contact, or when its cavity cannot be reduced after the escape of its contents. The whole interior then becomes a pus-secreting surface, and the disease proves a serious hindrance to the recuperative powers. Under no other circumstances does a woman show to greater advantage her natural tenacity of life and powers of endurance. I have seen this drain kept up for two years, and with a degree of hectic and emaciation unequalled in the course of any other disease, and yet recovery took place.

I have met with several instances where a collection of pus had become sacculated, and, without producing any constitutional disturbance, had remained in this condition for years, as I had every reason to believe from the history of the cases. An accumulation of pus in the neighborhood of the uterus, with thickened inflamed tissues about it, has been frequently mistaken for a fibroid with a supposed recent attack of cellulitis.

The following history of a case[1] is of interest in this connection.

CASE XV.—Mrs. E. K., aged twenty-nine, was admitted to the Woman's Hospital Nov. 9, 1868. She had given birth to her first child, without complication, and remained in good health until some five years previous to admission, when she was delivered of twins by a somewhat tedious but otherwise natural labor. Shortly afterwards she consulted an eminent physician of New York, for the relief of a feeling of discomfort experienced whenever she assumed the upright position. Her difficulty was recognized as due to the existence of a fibrous tumor on the posterior wall of the uterus, and to its presence was attributed her previous tedious labor. Some two years afterwards she gave birth to her last child by a natural although equally tedious labor. Her recovery was slow, and she was confined to her bed for six weeks before she regained her strength. On resuming her household duties she became conscious that her local difficulties had increased. For the first time she suffered from a continued irritation of the bladder, aggravated whenever she stood on her feet. Three years before her admission, she sought the advice of another physician, equally skilled, who confirmed the previous diagnosis. Although her general health remained good, the irritation of the bladder gradually increased, until she came under my observation.

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[1] "A Case of Faulty Diagnosis," etc., presented at the meeting of the State Medical Society, 1869, and published in the N. Y. Medical Record, Feb. 1, 1869.

I found a cystocele existing, which presented at the labia, and was due to the crowding forward of an enlarged uterus, which was partially retroverted from what seemed to be a large nodulated fibrous tumor on its posterior wall. By placing the forefinger of one hand in the vagina, and with the aid of the other over the relaxed walls of the abdomen, I was able, without difficulty, and without producing pain, to antevert the uterus. As I elevated the cervix on the point of my finger, while the fundus was thrown forward against the pubes, I made the tumor evident to several gentlemen connected with the institution. By this means I showed with what facility the size and relation of the tumor to the uterus could be accurately mapped out through the abdominal wall.

December 1. I operated for the relief of the cystocele, turning in the excess of tissue by bringing together the denuded surfaces with interrupted silver sutures. On removing the sutures, the line of union was found perfect, with the exception of half an inch near the neck of the bladder, where several sutures had torn out. After a few days, she sat up, without having had a bad symptom, but did not regain her strength rapidly. She was, however, entirely relieved of all irritation of the bladder, and she considered herself cured.

On Friday, Jan. 22, I closed the small opening in a few moments with four sutures, and without ether. The tissues which I had turned in had protruded through this opening, and I feared that this might cause the whole line gradually to separate. Nothing unusual occurred in her condition until Sunday afternoon, when she had a slight movement from the bowels, which was exceedingly offensive. Shortly afterwards, the expression of the patient's face indicated that some trouble was brewing, but there was no special symptom to indicate what it was. The pulse was ninety-five per minute, the skin and tongue in a normal condition, and the abdomen free from tenderness on pressure.

No change took place until five o'clock, Monday afternoon, when suddenly she had two copious, fetid evacuations per rectum. The pulse rose rapidly to 170, the tongue became dry, the body covered with a clammy sweat, and she sank into a profound collapse. By means of stimulants, heat to the extremities, and constant friction to the surface of the body continued during the night, she partially rallied. During Tuesday her condition improved somewhat, but she then began to show symptoms of blood-poisoning. About seven P. M. she suddenly had another large offensive evacuation from the bowels, which was now recognized as pus. She sank rapidly, and died shortly afterwards.

The following morning a post-mortem examination was made. On opening the abdomen, the peritoneum was found in a healthy condition. The supposed fibrous tumor proved to have been a large abscess, with several smaller ones communicating with it, between the peritoneum and uterus, and it had ruptured into the rectum. These abscesses were encysted within a common sac, and free from adhesions above except, at one point, to a portion of the small intestines, in the separating of which, for removal, the large sac was entered. The other adhesions extended along the bottom of the cul-de-sac, from the uterus to the rectum. Some thickening of the left broad ligament was found which had resulted from a previous attack, but the surrounding tissues were entirely free from any appearance of recent inflammation. The other organs were in a healthy condition; the brain was not examined.

In regard to the diagnosis, I fear that I would be liable to fall into error in any similar case not presenting a previous history more to the point, and where the patient was in good health, the uterus being somewhat enlarged, and menstruation more profuse than natural. The absence of fluctuation was due to the density of the outer cyst, while the mobility of the uterus, the mass in connection with it, and its nodulated surface, added greatly to the perplexity. My diagnosis was made after a careful examination, and without any knowledge whatever of the opinions which had been previously given in her case. In fact, I did not learn until after her death, that she had consulted other gentlemen. The statement was then made to me by her friends, as I was endeavoring to trace her previous history in regard to the time of formation of the abscess.

The point of interest in her case lies in the fact that she had been a healthy woman, attending to her daily duties for at least three years previous to admission. During this time she had suffered from no inconvenience beyond that to be attributed to the existence of the cystocele, which was entirely relieved by the operation. She dated the beginning of her troubles to the birth of twins five years before admission; and it was thought her tedious labor was due to the fibrous tumor detected shortly afterwards. Her difficult labor two years subsequent to the first would be naturally explained by the presence of the mass behind the uterus, which was also pronounced at this time a fibrous tumor. After this time, during the three years previous to my first examination, the irritability of the bladder was constant, except while she was in the recumbent position. The inference is, therefore, a natural one, that a mass had existed behind the uterus for at least five years. The question as to its character at once presents itself—either these abscesses formed after labor, or they were a result of the breaking down of a fibrous tumor, producing no constitutional disturbance or recognized local inflammation. From my examination of the specimen, my impression is that they were primary abscesses, for I am not aware that such a change taking place in a fibrous tumor has been observed or placed on record.

Examples are not wanting in other parts of the body. For instance, within the tunica vaginalis testis cheesy degeneration may take place, which sometimes breaks down into pus and remains for years without producing any disturbance.

Treatment of Pelvic Cellulitis.—At the first indication of a chill the patient must be put into bed, and every effort made to bring about a reaction. The continued application of heat must be made to the feet, as they will invariably be found cold. A warm drink will be of benefit, to which some stimulant may be added if needed, and a large hot flaxseed poultice should be placed over the abdomen. With reaction and pain, ten or fifteen grains of Dover's powder may be given, and, at the same time, a hot-water vaginal injection. When the patient is placed on a bed-pan for this purpose, her position must be made as comfortable as possible by the use of a suitable pillow under her back.

This injection should be continued literally *for hours*, if possible, and be repeated at short intervals. It is the only means we possess for aborting an attack of cellulitis, which *it will do, if thoroughly employed at the beginning.* The patient will be fully compensated for the temporary inconvenience and annoyance, since this treatment may prove the means of saving her, in all probability, many months of suffering.

While receiving the injection it is, therefore, necessary that the position of the patient should be a comfortable one, and the greatest care must be observed in protecting her from exposure to cold. Unless the nozzle of the injection pipe be made of horn, or some other non-conductor of heat, it will be necessary to cover it with a piece of India-rubber tubing, otherwise the patient will be annoyed exceedingly by the heat of a metallic nozzle between the labia, even at a temperature for the water far below what could be well borne if introduced through a pipe of non-conducting material. A Davidson's syringe, or some other instrument on the same principle, must be employed in preference to a fountain syringe. This is not an unimportant detail, for, if the experiment be made by any one of ordinary powers of observation, he will be convinced that the impulse of the jet of water is needed to excite the proper contraction of the vessels. A piece of rubber tubing can be attached to the bed-pan, so as to carry off the overflow of water to some receptacle under the bed. This can be emptied from time to time without disturbing the patient. The water must be injected slowly, but in a steady stream, and at as elevated a temperature as can be borne with comfort. The hands of any one person will soon become cramped, in continuously squeezing the ball of the syringe, so that it will be necessary to have the assistance of another.

The best rule is to continue the injection until reaction has fully taken place, by which time the fever will have subsided, and a free action of the skin will have been established. Whenever it is possible to prolong this action of the skin by the use of the liquor ammoniæ acetatis, or by any other remedy, it should be done. Nothing would be better than a Russian bath, if it were available without involving the risks of exposure, and without entailing additional pain from the movements which would be necessary. The use of the hot water is usually very grateful, and, as it evaporates under the bedclothing, the action of the skin is thereby much increased.

The continued action of the hot water is to stimulate the circulation in the pelvis, so that the local congestion may be relieved, before nature attempts to do so by the exudation of serum into the surrounding tissues. With this view, it will be seen that an increased action of the skin must be most beneficial, and should be kept up as long as possible.

Another remedy to be employed for relieving the congestion is opium, which, for its local effect, is best given in the form of an injection into the rectum. At all hazards, the local irritation, as expressed by pain, must be quieted, or the current of blood will continue to flow towards the congested part. Unfortunately, there is but a very short time at the beginning, when it will be possible to abort the attack, and in a few hours much damage will have been inflicted.

The next stage will be a critical one, and will test to the utmost the recuperative powers possessed by the individual. Nature will now make the effort to repair, by aid of the absorbent vessels, the damage done, and will rapidly accomplish the task if the progress of the inflammation can be arrested.

This stage is one of uncertain duration, lasting from a few hours to days, and is, as a rule, the one first seen by the physician, although not always recognized. The tissues have become infiltrated with serum, a local elevation of temperature exists in the vagina, the uterus may be movable, and, if the peritoneum has become involved, the inflammation is yet circumscribed and limited in extent. There will have been already a great mitigation in the degree of pain, and there may be even an absence of fever.

Rest in the recumbent posture is absolutely called for, the body must be protected from cold by an extra amount of flannel, and the extremities kept at a comfortable temperature by artificial means. If there is pain on pressure, it is the usual recommendation to apply a number of leeches to the abdominal wall over the seat of pain. Some temporary relief at least is frequently gained by this practice, but it is not to be followed, unless under some special circumstance. As the restoration of health depends on the patient's strength, this must not be impaired by the abstraction of blood, of which the benefit may be only temporary. Counter-irritation is of great service, and a marked improvement will be frequently noticed after the application of a blister. It is to be applied over the seat of pain, but with the precaution to avoid the groin, or the patient will be subjected to much unnecessary suffering. By using a mustard plaster, at first, to redden the skin, a more certain result will be obtained from the blister. When the material is good, six to eight hours should be sufficient for the blister to remain. It may then be removed, and the surface covered by a soft poultice protected on the outside by a piece of oil-silk. Then the whole may be secured by a light flannel binder, which should be worn as a protector whenever the abdomen is not covered by a large poultice. The poultice may be removed after a few hours as it becomes cool, and the several blebs formed by the blister are to be cut to allow the fluid to escape. After they have been emptied, the whole surface, which had been covered by the poultice, must be quickly wiped off with a soft sponge dipped into warm water, and with a little soap. Over this surface, when dried, is to be placed some loose cotton of the best quality. As it is a great object to husband the strength of the patient, it is necessary to heal the blister promptly and to limit its discharge as much as possible. Nothing will do this sooner than cotton, which should be allowed to stick to the raw surface, and reman undisturbed until it falls off after the surface beneath has become healed. After a day or two all the cotton which can be removed without force can be taken away, and the rest must be softened somewhat by the application of a sponge moistened with a warm weak solution of carbolic acid. Then the surface must be dried with a soft towel, and again covered loosely with fresh cotton. This must be repeated daily, if any odor can be detected, or if the patient should complain of its being uncomfortable. A blister can thus be applied every twelve or fourteen days until the necessity for it no longer exists.

Iodide of potassium is frequently used as an alterative in this condition, but it is not always reliable. I have seen the condition of a patient improve rapidly while taking it, and again I have seen not the slightest good result from its use. The same observation may be applied with equal force to the use of small and frequent doses of calomel. There are certain conditions where each of these agents seems to be efficacious, but with our present knowledge their use is somewhat empirical.

We must employ every means calculated to improve the general health. Tonics may be needed, but the use of iron in any form should be avoided if possible, on account of its constipating effect. To regulate the bowels during the later stages of cellulitis will prove a problem very difficult of solution. The food should be given in the most concentrated form, and the selection made so that the greater part will be assimilated, leaving but little residue to accumulate. It is all-essential to avoid an accumulation in the small intestines, since it will prevent a mechanical obstacle to the return circulation from the pelvis; and, much distress and increase of pain are caused by any distension of that portion of the rectum partially constricted by the cellulitis. The contents of the bowels should be kept in a semi-fluid condition, since the patient is either unable to strain at stool, or instinctively avoids doing so, through fear of causing pain; and any fecal mass in the rectum will add greatly to her discomfort. The difficulty of managing these cases is greatly increased by the fact that few are able to tolerate a rectal enema, except in so small a bulk as to be of but little service. Any distension of the rectum, even in this way by fluid, must necessarily make pressure on the inflamed tissues. Scybalæ will frequently form notwithstanding all care, and, when in the rectum, the patient is generally unable to effect their expulsion. I instruct my nurses to introduce a finger, well oiled, into the retum to remove any accumulation there may be, as soon as the patient begins to realize any discomfort. This requires some little expertness, for any approach to violence will produce much unnecessary suffering. The operation, therefore, is well worthy of the physician's personal attention, even if he has to administer the relief himself. A few ounces of warm flaxseed tea or oil may be thrown into the rectum, and then any hardened mass can be the more readily removed. The index finger is to be gently passed in front and beyond the mass, so that the necessary force for the removal can be exerted downwards and backwards towards the sacrum, and without pressure against the seat of inflammation. Sulphur in combination with the bitartrate of potassa answers well, as does an occasional dose of castor oil. I have had women under my care who were fortunately able to take every night a spoonful of castor oil which regulated the bowels perfectly without causing any disturbance of the digestion. Occasionally, it is good practice to give a pill containing five grains of inspissated ox-gall three times a day, and if there be any flatulence, four grains of assafœtida in a sugar-coated pill, may be added, provided it can be taken without disturbance to the stomach, which is already liable to derangement through sympathy with the pelvic condition. We should, therefore, aid digestion by judicious means, and leave the stomach at rest, as far as possible, when it is not necessarily engaged in digestion; for, as soon as nutrition becomes impaired through failure of the digestive powers, recuperation ceases.

Whenever a patient is able to take cod-liver oil without deranging the digestion, it will prove a most fortunate circumstance, as this remedy is very effective in repairing the waste.

Of all the diseases and complications we may be called on to treat in this branch of surgery, we will find none in which sunlight and fresh air prove so beneficial and essential as in pelvic abscess. Unless it be during the mildest season of the year, a patient suffering from this disease will tolerate but little exposure, from being so sensitive to the effects of cold. She should occupy a bright, sunny room, and, as far as possible, she should carry out the suggestions I have already given on this subject.

The vaginal injections of hot water are to be continued throughout the progress of the case, and are best administered early in the morning and at night. A large basinful will answer every purpose, for the time has now passed when the prolonged use of this agent can be beneficial as a prophylactic. But it may indirectly stimulate the absorbents and diminish somewhat the pelvic circulation, and soothe the general system by temporarily relieving the local irritation. It thus gives great comfort, and is most useful in inducing sleep, when employed after the patient has been prepared for the night.

The use of opium and anodynes generally will require a discriminating care on the part of the physician. These remedies are to be held in reserve for a last resort, as the sheet anchor to the threatened wreck. There is a period always to this disease, if it becomes general, when an opiate furnishes almost the only hold on life. It is then the only effective agent left, and acts as a tonic, by allaying pain, affording rest, and checking the waste to the nervous system. I am certain that I have seen cases where recovery was due alone to the anodynes having been held in reserve. The common practice is to get the patient so dependent on their use in the early stages of the disease, that when most needed, their good effects are not obtained, such large doses becoming necessary, that the appetite and the digestion are impaired by their use. It is a bad plan ever to allow the patient to actually suffer from pain, but there are times when the hot-water injections or some other mild means will afford relief. But when an opiate is necessary, let it be always administered as I have already recommended, either by injection or by a suppository in the rectum, and let its use be made as little a matter of routine as possible. Of all modes of giving opium, that by the hypodermic syringe is the most dangerous, since it can be so readily done. The inventor of this method has given, I fear, a curse to the human race instead of a blessing. I may be deemed prejudiced, but I have long felt that the medical profession is largely responsible, in the abuse of this instrument, for the wide-spread existence of the opium habit. This vice is increasing rapidly over the country, and it is to be feared that we shall, at no distant day, rival the Chinese in the consumption of this drug.

For convenience of description, we may make a third stage in this disease, that of exudation. The stage of infiltration, if not arrested by convalescence, passes so rapidly into that of exudation that the two stages may be regarded as one and the same, as the same course of treatment is applicable to both.

If the progress of the exudation is not arrested and followed by recovery, we must expect a most serious sequence, viz., the formation of pus. This is ushered in by the occurrence of rigors from time to time, followed by fever and an increase of pain. The pus formed from the cellular elements of the inflamed tissue is at first scattered about in small masses which in time break down the intervening structures and form one or more abscesses. These abscesses sometimes promptly find an outlet, convalescence begins at once, and the cavity rapidly disappears. But, with many, it remains open for an indefinite period, its lining membrane forming a pus-secreting surface. The danger to the patient is now greater than at any other stage of this disease. In addition to the great draft made on the system by the profuse discharge of pus, the patient, in all likelihood, begins to suffer from hectic or irritative fever and blood poisoning. As long as the pus remains sacculated, the latter danger is slight, but, after the abscess has been emptied of its contents, nature makes an effort to remove the difficulty by a process of resorption. So in the progress of the last stage of this disease the system is being constantly poisoned and as long as sufficient strength remains, the poison will continue to be eliminated.

Quinia, opium, and the most nutritious diet will be now the chief means for sustaining the patient. There will scarcely ever be more than a remission of fever in this stage, but by watching the temperature as it varies in the vagina it will be seen that there is almost always an increase of fever between noon and midnight. This condition and the tendency to blood-poisoning must be kept in check by the use of quinia in large doses, which, it is well known, possesses the property of lessening the frequency of the pulse and lowering the temperature. Quinia is said to possess the further property of limiting the migration of white corpuscles and the formation of pus, which, if it is true, gives it additional value in this disease. Recently it has been claimed that quinine, if combined with double its quantity of bromide of potassium, or with hydrobromic acid, may be administered in large doses without giving rise to quinism, and without loss of its own therapeutic properties. My experience with this combination has been limited, but so far as it goes, it is favorable to it.

We have a resource of value in the careful use of aconite, for lessening the temperature, slowing the respiration, and diminishing the frequency of the heart's action. Digitalis has been also used for the same purpose, but I have not found it as efficacious, or as safe as aconite.

It has been shown experimentally that aconite in moderate doses stimulates in a marked manner the inhibitory cardiac ganglia, slowing the heart and giving it rest by lengthening the pre-systolic period. I have noted that with a diminution in the frequency of the pulsations there comes an increase in their force. It should not be given sufficiently long, or in sufficiently large doses, to secure its secondary effects which are toxic; but as soon as the contractions have been reduced say twenty beats in the minute, it is well to lessen the dose and watch the effects.

While taking aconite, it is important that the patient should be nourished with regularity and care, and receive alcoholic stimulants to promote the beneficial effects and oppose the depressing tendency of over-doses of the drug.

Very few of the thermometers sold by the instrument-makers are reliable. They are not fit for use until at least a year after they have been made, since the tubes contract, and the scales, if adjusted too soon, give erroneous indications. They should never be graduated until all shrinkage in the glass has ceased after they are thoroughly seasoned, for I have noted a difference of as much as three degrees between two instruments from the same maker.

An elevation of two or three degrees above the natural temperature of the body is of but little moment in an attack of cellulitis. But if a reliable instrument registers the temperature at 105°, the indication is a very serious one, and but few recover if the temperature remains above this point for any length of time. The higher the range of temperature the more certain does it indicate that the peritoneum is involved and the inflammation is extending.

The rule is as applicable here as in general surgery, to open freely a collection of pus as soon as it can be detected. I do not regard it as sound practice to wait until the pus finds an outlet for itself. There is no possible way by which the contents of an abscess can be disposed of except by rupture. It is, therefore, the safest procedure to open the abscess through the vagina as soon as the presence of the pus can be detected. This, however, is sometimes very uncertain unless the walls are thin, for the sensation of fluctuation may be well marked and yet no collection of fluid be found. But, when we are sure of the existence of the abscess, there can be nothing gained by allowing its contents to burrow to a greater extent through the tissues, and possibly to escape into the peritoneal cavity. Whether the abscess has ruptured into the vagina, or been evacuated artificially, the opening must be sufficiently large to admit of its cavity being thoroughly washed out. I employ warm water with a little impure carbolic acid or an injection of warm water through which a few spoonfuls of brewer's yeast have been diffused. The irritative fever will lessen as the cavity contracts, and as its lining membrane is brought into a more healthy condition so that the discharge from it becomes greatly diminished. The opening should be at the most dependent portion, if possible, although this cannot always be a matter of selection, but is a fortunate circumstance when it happens, because thereby the cavity more easily contracts from being properly drained. With a free opening, admitting the ready access of air, the discharge will increase for a time and become more offensive, but this can be greatly lessened by washing out the cavity. The vaginal injections are to be continued, and may be given by the nurse as a means of keeping the canal free from decomposing pus. But the washing out of the tract of the abscess should never be devolved by the surgeon upon an assistant. The operation requires judgment, and the water should be thrown from a long nozzle glass syringe, without force, and with care. This is a necessary precaution, since I have known of two instances where the sac was ruptured and death ensued from the contents passing into the abdominal cavity. This danger is a temporary one at the beginning, for nature will soon form some adhesion or thickening at any weak point, after which this accident cannot occur. The nozzle of the syringe must be turned in different directions so as to wash off the sides of the cavity, and the injection is to be continued until the water comes away clear. After I have continued to wash out a cavity for some time, and the condition of the patient may have ceased to improve, I inject a weak solution of iodine and water. If no particular disturbance be caused, I increase its strength in a few days, and watch the effect. The object is to destroy the pyogenic surface by a solution strong enough to effect the purpose, without lighting up a fresh attack of cellulitis.

A pelvic abscess does not often empty into the rectum alone, but frequently it does into both the rectum and vagina in the same case. An additional opening into the rectum complicates the case very much, and the result is never so favorable as when the opening is only into the vagina. When the abscess opens into the rectum the discharge is always more profuse from the irritation caused by the feces and flatus which pass into it. Unless the cavity of the abscess can be washed out from the vagina, we will be obliged to rely chiefly on the endurance of the patient for recovery.

I have met with but a single instance of an abscess forming in the cellular tissue between the uterus, bladder, and vagina. The case came under my care a year or more after the abscess had ruptured into the bladder, and in consequence of the escape of urine through the vaginal canal. Through an opening located in the median line, and in the centre of the vesico-vaginal septum, a probe passed back along a sinus to the uterus, but did not enter the bladder. With a pair of blunt-pointed scissors, I laid open the tract until I reached the small cavity which had been the seat of the abscess, and through a thin anterior wall a small opening was found passing directly into the bladder. The sides of this cavity were carefully freshened by means of a pair of scissors, and when too thin were scraped, so as to obtain a denuded surface. Interrupted sutures were then introduced and the sides of the cavity brought together in the median line.

Two instances of cellulitis have passed under my observation, in which the urine escaped directly into the vagina from the left ureter. In one case the ureter seemed to have formed an adhesion to the vaginal wall just behind the junction of the posterior cul-de-sac with the cervix. The contents of the abscess emptied into the bladder, while the pressure of the accumulation and the pus produced so much irritation that the passage of urine from this ureter into the bladder became obstructed, and forced its way into the vagina.

In another case the left ureter was cut across by the surgeon, at precisely the same point, in opening the abscess, so that both pus and urine passed into the vagina. These two cases will be again referred to, more in detail, under the head of vesico-vaginal fistula.

The natural position of this portion of the ureter is outside of the bladder, and in these two cases was fully an inch above its vesical orifice. The displacement must have been brought about by the weight and downward pressure of the abscess, and it would, therefore, be well in opening an abscess from the vagina to avoid, if possible, this locality.

Dr. Brickell, of New Orleans, has recently made an important contribution[1] to this subject, and his views are summed up by himself as follows:—

"Conclusions: 1. I have no doubt at all that there are two distinct forms of pelvic inflammation—serous and phlegmonous, or suppurative. An attack of either may be abortive—that is, may fail to result in formation of pus or effusion of serum. But, should either pus or serum be formed, then

2. I am sure that evacuation is the proper practice; and

3. Either should be evacuated per vaginam.

4. The presence of pus in any portion of the body is not to be tolerated by the surgeon. I contend that the presence of effused serum in the pelvis is not to be tolerated either. As long as it is present, in addition to the pain and prostration, there is the abiding stimulus to repeated inflammation, and the pelvis can and will be ravaged.

5. Topical applications and internal remedies have no influence on pelvic serous effusion, according to my observation."

Not being in general practice, I have seen but few cases before the abscess had already ruptured. In my own practice I have also been so fortunate as to have had a very limited experience. Necessarily, many cases of cellulitis have occurred in my hands during the course of treatment or after operations. But during sixteen years' service in the Woman's Hospital I cannot recall a single instance where the inflammation terminated in an abscess. During the same time, in my private practice, I have had two cases occurring after division of the cervix, which I have referred to when treating of this operation. In fact I have never had the opportunity of opening more than five or six pelvic abscesses in my life, and I have never met with a collection of serum, as described by Dr. Brickell. In post-mortem examinations of inflammatory conditions resulting from childbirth, I have so frequently found the connective tissue infiltrated with serum, that I have always regarded its presence as indicative of a stage of the cellulitis, which would naturally terminate in a pelvic abscess if not arrested. Dr. Brickell reports a number of cases relieved by evacuating accumulations of serum equal in quantity to the contents of an abscess. I can recall a number of cases which have been under my observation with thickened tissues, where no treatment seemed to have had the slightest effect, and finally they have passed into other hands. It is quite probable that among this class of cases will be found these collections of serum, since Dr. Brickell does not seem to have met with an instance where such an accumulation has found an outlet without the aid of the knife. He cites a case of a collection of pus producing no irritation for a length of time after the acute symptoms had vanished, and it is of particular interest in connection with the history of the case of supposed fibroid recently given. Dr. Brickell writes: "Suppuration, Case IV., cited by me, shows clearly how free deposits of pus can take place in the pelvis as results of acute attacks of inflammation, and yet, when the acute symptoms subside, the patient may get up, improve in appearance, and even work for a living for several years in comparative comfort. After a while, however, active inflammation is relighted, and the result will be destruction." This is not the rule, however, with collections of pus, and there are other cases, as I have stated, which remain at a standstill for years. In these cases I hope we may find this accumulation of serum, and if Dr. Brickell shows that they can be relieved by means of the aspirator, he will have indeed done good service. But experience alone can determine the proper time for making an exploration; but I cannot regard the introduction of the trocar into the inflamed tissues of the pelvis as a procedure free from danger under all circumstances. These remarks are prompted by the recollection of two cases where, having erred in my diagnosis, and finding no fluid on the introduction of the trocar, the patients' lives were seriously jeopardized by the fresh attack of cellulitis which resulted.

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[1] The Proper Treatment of Pelvic Effusions. By D. Warren Brickell, M.D., Professor of Obstetrics, etc., Charity Hospital Medical College, New Orleans. American Journal of the Medical Sciences, Philadelphia, April, 1877.

Before closing this subject, I will direct the attention of the reader to a condition which does not seem to have been described by any other observer. After an attack of cellulitis has subsided the tissues which had been inflamed contract. When the inflammation has occurred in one of the broad ligaments, the neck of the uterus will be drawn towards the injured side in consequence of this ligament becoming shortened. The uterus under these circumstances will frequently become enlarged, and it will often be a matter of surprise to find, after a reasonable time, that there has been no improvement in the condition of the uterus, even under the most approved course of treatment. The woman will become an invalid from her inability to exercise, and after awhile another attack of cellulitis may come on without any apparent cause. If a weight were hung by two or more cords of equal length, and one of them were dampened, that one would shorten so much that the whole weight would become suspended from it. And so the weight of the uterus and its appendages will have to be sustained by the ligament or part which has been inflamed and shortened. The consequence will be a state of congestive irritability, which will not only neutralize all remedial efforts, but sooner or later will induce an attack of cellulitis in the opposite healthy ligament, as a result of the constant one-sided traction.

If we gently lift the uterus to a given point, on the extremity of the finger, we will generally find, as I have already said in the early part of this work, that the patient will experience the greatest relief and the pulsation of the vessels will gradually cease. The first step to be made towards a restoration to health is to lift the uterus and maintain it at a plane in the pelvis at which this traction will be entirely removed. This is to be accomplished by a pessary curved enough to lift the organ and at the same time moulded in such a manner as not to press laterally upon the seat of inflammation or the thickened ligament. I have frequently employed, for this purpose, an instrument formed from an ordinary lever pessary by twisting it on itself, so that one end may stand at a right angle to the other. The front half of the pessary remains unchanged, but the part which would otherwise have pressed against the inflamed broad ligament is bent over to the opposite side, so as to support the uterus under the healthy broad ligament, and along half of the posterior cul-de-sac, the seat of the old inflammation not being touched by the instrument.

CHAPTER XIV.

DISPLACEMENTS OF THE UTERUS.

Anatomical supports of the uterus—Normal position of the uterus—Pelvic roof—Downward displacements, or prolapse—Causes—Versions; forward, backward, lateral—Causes of versions—Flexures.

THE uterus receives its support from the utero-sacral ligaments behind, the broad ligaments on either side, the round ligaments in front, and from the connective tissue of the pelvis.

As the peritoneum dips down between the organs and over the Fallopian tubes, it includes a certain amount of the cellular, or connective, tissue between its folds, which, with a few muscular fibres, form the uterine ligaments. These ligaments, with the exception of those from the uterus to the sacrum, offer but little resistance to any downward pressure or prolapse, and serve only as guys to steady the organ and to oppose a tendency to version. They are aided in this by the folds of the vagina about the cervix, and by the cervix which acts as a pivot or lever, to maintain the axis of the uterine canal in its natural relation to the vaginal axis.

We are indebted to Dr. Henry Savage for the demonstration of the structures which really support the uterus and oppose its displacement. To illustrate his views, Figs. 47 and 48 have been copied from Plate IX. of his work,[1] with the accompanying description. Fig. 47 represents a horizontal section of the abdomen on a level with the upper edge of the ilium on each side; the uterus drawn down through the vagina by means of a vulsellum attached to its neck. Moderate traction, as much as possible in the direction the uterus would take in the early stage of ordinary prolapsus, was continued until it seemed to threaten some physical damage to the structures now more strongly opposing its further descent. The parts concerned, exposed to view as shown in the figure, assumed the following relative bearing:—

B, bladder, depressed and compressed towards the pelvis by U, uterus, which has descended about an inch and a half. C, utero-sacral ligaments, having lost their natural curve round the forepart of the rectum, diverge, and become straight from being forcibly stretched between their attachments. O, alar mesentery and contents pulled forward and slightly depressed. L, round ligament curved around (but not on the stretch) in following its uterine attachments. *g*, ureter. *a*, spermatic vessels somewhat more prominent under their peritoneal covering. No sign of strain whatever, on either the broad or round ligaments. The utero-sacral ligaments having been divided transversely, the uterus yielded rather suddenly about another inch. Before examining the new obstacle which now prevented its further progress, the pelvis was divided perpendicularly and from before backward."

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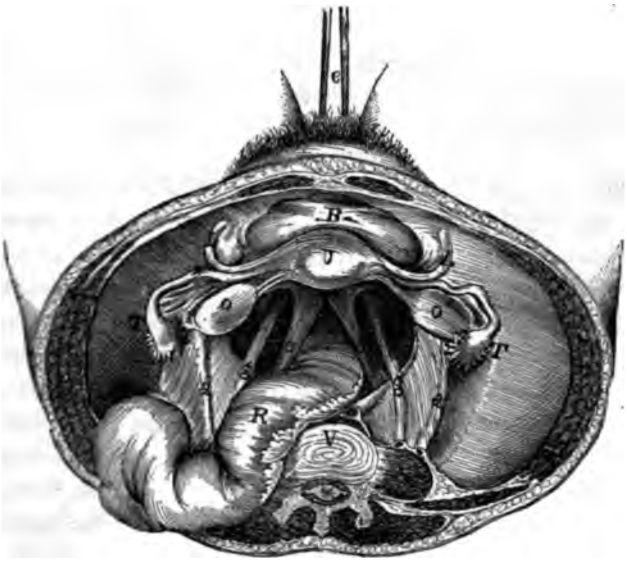
[1] Illustrations of the Surgery of the Female Pelvic Organs, by Henry Savage, M.D., etc., London, MDCCCLXIII.

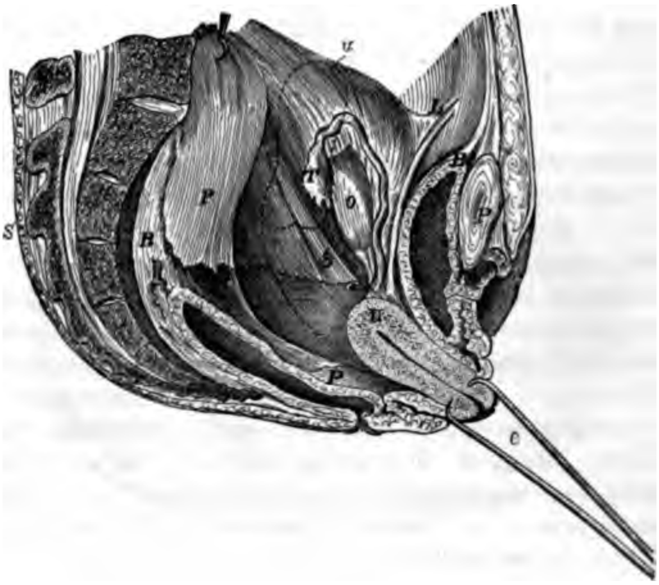
Fig. 47.



Transverse section of the pelvis. (Uterus drawn down.)

Figure 48 represents the "left half of the pelvis, and corresponding half section of B, bladder; U, uterus; P. P., peritoneum divided; R, rectum; P, pubic symphysis; O, ovary; T, Fallopian tube; L, round ligament. The three latter are still in their natural relations with the broad ligament, which is seen on the stretch, pulling strongly on the margin of the pelvis. The bladder is drawn down with the uterus, owing to the intimate connection between the two. The rectum is not disturbed; the anterior layer of its sub-peritoneal cellular sheath, P, retains a much weaker hold of the vagina than existed in the case of the bladder, vagina, and uterus. The uterus is seen half out of the vulva, retained only by the broad ligament, which, when divided or stretched sufficiently, removes the last obstruction to complete prolapsus of the organ. After the uterus came down a further inch, as the result of dividing the utero-sacral ligaments, some retaining agent, other than the broad ligaments, still prevented its arrival at this last stage, as above described. The obstruction was found to be due to the sub-peritoneal pelvic cellular tissue, particularly where it surrounds and accompanies the uterine bloodvessels. This tissue is here strengthened by additional trabecular filaments, so disposed as to support the vessels and defend them from the effect of sudden strain incidental to the various movements of the body, more especially in cases of uterine enlargement. Complete prolapse was effected only after yielding of the pelvic reflections of the broad ligament. This occurred from behind forwards, the round ligaments being the last put on the stretch. U, outline of position of uterus before the commencement of the experiment."

Fig. 48.



Left half of pelvis. (Uterus drawn down.)

The pelvic roof is thus decribed by Savage: "A plane passing horizontally backwards from just below the sub-pubic ligament to the attachment of the utero-sacral ligaments at the sacrum, would indicate the level where the utero-vesical peritoneal reflections pass from the pelvic organ to the pelvic wall. The upper wall of the vagina is firmly adherent to the base of the bladder (vesico-vaginal septum), and to the whole of the forepart of the uterine cervix. It follows a slightly curved line from the vestibule to the uterus, and through the utero-sacral ligaments it is attached to the sacrum. When these structures are intact, they constitute an important line of mutual support for the vagina, uterus, and bladder (pelvic roof)."

It is impossible to establish a point which can be accepted as the normal position of the uterus in health. This difficulty arises from the fact that each woman has her own individual point, from which, however, some deviations frequently occur without being necessarily the result of disease. The uterus will change its position in health with every movement of the diaphragm; it will be also influenced by the condition of the bladder, by constipation, mode of dress, and by any temporary obstruction to the pelvic circulation. The existence of even a marked deviation is often of little moment in itself. A malposition, however, may sometimes render the woman more liable to suffer from some accidental complication, from which she might escape, were the uterus in position. But, until the circulation of the uterus becomes obstructed from accident, and this condition is superadded to the displacement, she may remain long in ignorance of her condition.

THE UTERUS MAY BE DISPLACED DOWNWARD, TO EITHER SIDE, OR IN AN UPWARD DIRECTION.

The downward displacement, or prolapse, is in proportion to, and occurs from, any increased weight in the organ itself, or in consequence of its being crowded lower into the pelvis by some growth above. In a simple prolapse, there may be no deviation in the uterine axis until the floor of the pelvis has been reached, but any descent beyond this point towards the vaginal outlet is always accompanied by a proportionate version of the fundus into the hollow of the sacrum.

When the uterus has been crowded from the vaginal outlet, in consequence of increased weight or pressure above, the progress in the displacement will have been similar to that demonstrated by Dr. Savage. But the same result or a condition of procidentia takes place more frequently from a want of proper support at the vaginal outlet, so that the process, as described by Savage, is reversed. Whenever the perineum has been extensively ruptured after childbirth, a fold of the posterior wall, or recto-vaginal septum, soon presents at the outlet of the vagina. From the direction of the rectum and the curve in its course, by which the force is expended on the weakened septum, this prolapse must be increased by every effort at stool. In consequence of this condition, and from a want of proper support, when the woman is in the upright position, the whole posterior wall of the vagina becomes gradually involved. The utero-sacral ligaments at length yield, the uterus prolapses and becomes retroverted, the anterior wall of the vagina is dragged down from before backward and turns under the arch of the pubis, and the procidentia becomes complete.

VERSIONS OF THE UTERUS TAKE PLACE IN THE FORWARD DIRECTION, BACKWARD, AND TO EITHER SIDE.

Some degree of forward displacement, or *anteversion*, may be accepted as a normal position. In fœtal life, during childhood, and after puberty in the healthy female who has not borne children, it will be found an exception to the rule whenever the uterus occupies any other position than one of moderate anteversion.

Retroversion is the most common form of uterine displacement, and is not at all rare.

Lateral versions are rare, seldom congenital, and ordinarily result from shortening of the broad ligament after an attack of cellulitis.

Versions of the uterus may, in general terms, be attributed to imperfect development and to mechanical causes. The instances resulting from imperfect development are comparatively rare. A version may occasionally result from a deficiency in the length of one of the uterine ligaments by which the organ is drawn towards the shortened side. But practically almost the only displacement which can be attributed to a natural defect is that due to a want of development in the shape and size of the vagina. In such an instance, the vagina terminates around a cervix of unusual length, without forming a posterior cul-de-sac. The consequence is, that the neck of the uterus, being too long, is necessarily crowded forward in the vagina, in the direction offering the least resistance, and retroversion follows. This result may be considered a mechanical one, and due to a congenital cause or defect.

The mechanical causes of version are easily recognized; these are brought into play by the aid of gravity. As an instance, the growth of a fibroid may be cited, or an unequal increase on one side of the uterus, from some local obstruction to the circulation, by which the organ would naturally be tilted to the heaviest side.

From versions we naturally pass to the consideration of flexures, which are, with a single exception, but exaggerated forms of the original displacement, and a result of some local obstruction in the circulation of the uterus itself, or in the surrounding tissues.

FLEXURES ARE FORMED IN THE CERVIX AND BODY OF THE UTERUS.

Those in the cervix, it is thought, have their origin about the age of puberty from faulty nutrition. This form of flexure occurs at or just below the vaginal junction, in consequence of an undue length of development in the cervix, a condition to which reference has already been made. The diameter, or rather the resisting power, of the cervix will generally determine the form of flexure. Since the size of the cervix is so out of proportion to the capacity of the vagina, it must either become bent on itself, thus forming a flexure, or the neck must be in the axis of the vagina, which will throw the fundus of the uterus into the hollow of the sacrum. When the cervix becomes bent on itself, the body of the uterus will remain in position, or be somewhat anteverted. But the cervix becomes ultimately more elongated and snout-shaped, from being crowded forward towards the vaginal outlet. If the neck remains in the axis of the vagina, and the uterus becomes retroverted, sooner or later, difficulty must arise from its faulty position, since it is one which is likely to be increased by constipation or over-exertion. As an inevitable consequence of extreme retroversion, the circulation in the uterus must become sufficiently impeded to greatly increase the size of the organ, and thus add to the difficulty. The additional provocation, as an exciting cause of irritation, is generally sufficient to cause cellulitis in the neighborhood, with the effect of still more increasing the congestion and size of the uterus. In proportion to the descent of the fundus

Fig. 49.

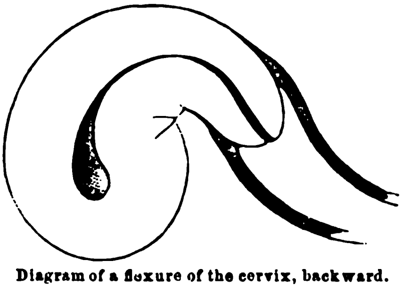


Diagram of a flexure of the cervix, backward.

into the hollow of the sacrum, the cervix will be pressed upward against the anterior wall of the vagina, and be bent upon itself at or below the vaginal junction. This is the commonest form of retroflexion (see Fig. 49), although occasionally we find in addition a flexure of the body of the uterus above. A flexure of the body alone is rarely found until the case has been of long standing, and atrophy of the cervix has taken place, from obstruction to the circulation, and that of the body has already begun. Frequently the flexure in the cervix is not recognized, and the observer is misled by the increased thickening on the posterior wall of the uterus, which gives the impression to the finger as if the uterine body was flexed upon itself at that point.

Until the treatment comes to be considered we will not describe the other forms of flexures found in the uterine body, since what has already been stated in regard to versions is equally applicable to the corresponding flexures.

CHAPTER XV.

ETIOLOGY AND TREATMENT OF UTERINE VERSIONS.

Tables XVIII. to XXIII. inclusive, showing the relations of versions to menstruation, marriage, celibacy, fruitfulness, sterility, pregnancy, age, pain, etc., also percentages—Treatment of versions.

It is difficult to determine the class of cases which should be grouped together for the study of these displacements. There were eight hundred and four cases of versions, or 32.85 per cent. of the total number of women under observation. This number includes all displacements from whatever cause; whether from impairment of nutrition or actual disease of the uterus itself—and these may be called original versions—or from the existence of disease in the neighboring parts—which versions may be termed secondary. Of original versions there were five hundred and fifty-five cases, being 26.76 per cent. of the total number of women under observation, and our consideration shall be limited to these.

The numbers and percentage of each displacement are shown in Table XVIII., for the unmarried, sterile, and fruitful women, the last class being again subdivided into women who had never miscarried, those who had borne children to full term but also miscarried, and those who had miscarried and never gone to full term.

The number who menstruated for the first time, between the extreme ages of ten and twenty, are also given, with the average age at puberty for each class, and the average age at marriage.

These tables are given as part of the history of displacements, but, however useful they are, we cannot accept deductions from them as conclusive, until confirmed by more extended observations. They seem to indicate that sterile women menstruate for the first time later in life than any other class; and that fruitful women who miscarry begin to menstruate later than those who go to full term. For it is shown that those who always miscarried approached nearer than any other the averages of the first menstrual age of the sterile. Those who habitually miscarried show also a larger proportion of retroversions than those who have borne children to full term. On the other hand,

TABLE XVIII.—*Versions of the Uterus.*

		Age at first menstruation	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	Summary.					Average age at puberty.	Average age at marriage.
														For-ward.	Back-ward.	To the right.	To the left.	Total.		
Unmarried.	Versions of the uterus.	Forward	....	....	6	5	10	7	5	1	....	....	....	34	....	....	....	....	14.08	
		Backward	....	4	2	12	16	10	5	4	2	....	....	....	55	....	....	....	14.21	
		To the right	....	....	....	....	....	1	....	1	....	....	....	....	....	2	....	....	16.00	
		To the left	....	1	....	1	1	....	....	....	....	....	....	....	....	....	3	....	12.66	
		Total	....	5	8	18	27	18	10	6	2	....	....	....	....	....	....	94	14.13	
		Percentage	....	5.31	8.51	19.14	28.72	19.14	10.63	6.38	2.12	....	....	36.17	58.51	2.12	3.19			
Sterile.	Versions of the uterus.	Forward	1	2	7	14	16	11	4	1	1	....	....	57	....	....	....	....	13.76	21.47
		Backward	....	1	12	19	24	9	11	7	1	3	....	....	87	....	....	....	14.51	22.55
		To the right	....	....	....	....	3	....	....	....	....	....	....	....	....	3	....	....	14.00	20.33
		To the left	....	....	....	3	1	2	2	1	....	....	....	....	....	....	9	....	14.66	21.55
		Total	1	3	19	36	44	22	17	9	2	3	....	....	....	....	....	156	14.25	22.05
		Percentage	.64	1.92	12.18	23.07	28.20	14.10	10.89	5.76	1.28	1.93	....	36.53	55.76	1.92	5.76			
Fruitful.	Versions of the uterus among those who had gone to full term and had never miscarried.	Forward	....	5	12	12	38	16	6	5	3	....	....	97	....	....	....	....	14.04	20.80
		Backward	....	3	17	20	17	22	9	2	3	....	....	....	93	....	....	....	13.94	20.32
		To the right	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
		To the left	....	....	....	2	1	....	....	....	....	....	....	....	....	....	3	....	13.33	29.33
		Total	....	8	29	34	56	38	15	7	6	....	....	....	....	....	....	193	13.95	20.70
		Percentage	....	4.14	15.02	17.61	29.01	19.69	7.77	3.62	3.11	....	....	50.25	48.18	....	1.55	....		
	Versions of the uterus among those who had gone to full term and had also miscarried.	Forward	....	1	8	4	4	9	8	3	1	....	....	38	....	....	....	....	14.65	19.68
		Backward	....	3	8	5	8	7	3	1	1	....	....	....	36	....	....	...	13.72	20.00
		To the right	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
		To the left	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
		Total	....	4	16	9	12	16	11	4	2	....	....	....	....	....	....	74	14.06	19.87
		Percentage	....	5.40	21.62	12.16	16.21	21.62	14.86	5.40	2.70	....	....	51.35	48.64	....	....	....		
	Versions of the uterus among those who had never gone to full term.	Forward	....	....	2	2	4	2	....	....	....	....	....	10	....	....	....	....	13.60	20.40
		Backward	1	1	4	3	5	3	2	4	1	....	....	....	24	....	....	....	14.20	22.87
		To the right	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	20.00	21.00
		To the left	....	....	....	1	....	....	2	....	....	....	....	....	....	....	3	....	15.00	22.33
		Total	1	1	6	6	9	5	4	4	1	....	1	....	....	....	....	38	14.26	22.13
		Percentage	2.63	2.63	15.78	15.78	23.68	13.16	10.52	10.52	2.63	....	2.63	26.31	63.15	2.63	7.89	....		
	Versions of the uterus among all	Forward	....	6	22	18	46	27	14	8	4	....	....	115	....	....	....	....	14.10	20.48
		Backward	1	7	29	28	30	32	14	7	5	....	....	....	153	....	....	....	13.93	20.56
		To the right	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	20.00	21.00
		To the left	....	....	....	3	1	....	2	....	....	....	....	....	....	....	6	....	14.16	25.83

it will be seen that childbearing seems to increase greatly the proportion of anteversions. The number of lateral versions is too small to warrant definite conclusions concerning them.

Table XIX. presents a summary of all classes, as given in Table XVIII. If we accept the data furnished by Table III., page 155, as to the relative proportion of the unmarried, sterile, and fruitful, it will be seen by the table before us that neither class is more liable to suffer from versions than the other two. In the last column to the right of Table XIX. is given the proportion of each class of women who suffered from versions. By comparing these with the relative proportions, as given in Table III., it will be found that they are almost identical.

TABLE XIX.—*Frequency of Versions among the Unmarried, Sterile, and Fruitful.*

	Forward.	Percentage.	Backward.	Percentage.	To the right.	Percentage.	To the left.	Percentage.	Summary.			Percent. and total.
									Unmarried.	Sterile.	Fruitful.	
Unmarried....	34	36.17	53	58.51	2	2.12	3	3.19	94			
Percentage..	14.40	....	18.64	....	....	....	....	....	....	....	....	16.93
Sterile........	57	36.53	87	55.76	3	1.92	9	5 76	....	156		
Percentage..	24.15	....	29.15	....	....	....	....	....	....	....	....	28.10
Fruitful.......	145	47.57	153	50.16	1	.32	6	1.96	....	....	305	
Percentage..	61.44	....	51.86	....	....	....	....	....	....	....	....	54.55
Total..........	236	....	295	....	6	....	18	....	....	....	....	555
Percentage..	....	42.52	....	53.15	....	1.08	....	3.24				

Table XX. is of interest in pointing out that there was no special indication given at puberty of the existence of disease among those women who, in after life, suffered from version.

Table III., page 155, which has been already referred to, gives also the proportion of women who were regular from the first, of those who became regular, and of those who were never regular. It also shows that a large proportion of women commence their menstrual life in good health, and the percentage (72.33) given is doubtless correct. By comparing Table XVI. and Table III. a remarkable coincidence may be noticed, the percentages for the several classes in Table XVI. being almost identical with those taken on the total number of all women under observation.

The percentages for retroversion differ slightly from the general percentages indicated in Table III., and show that of women who in after life suffered from retroversion a larger proportion were regular from the first, leaving a smaller number for those who became regular afterwards, or who were never regular. The deductions, therefore, to be drawn from these figures are greatly in favor of the supposition that retroversions, as a rule, have their origin at a later time in life.

The only point to be noted in regard to lateral versions is that the large proportion of those who suffered from them were sterile.

TABLE XX.—*Condition of Menstruation with Versions.*

	Condition of menstruation.	Unmarried.	Sterile.	Fruitful.	Total.
Anteversions.	Regular from the first	25	40	95	160
	Percentage	69.44	76.92	71.96	72.72
	Regular afterwards.	5	8	23	36
	Percentage	13.88	15.38	17.42	16.36
	Never regular	6	4	14	24
	Percentage	16.66	7.69	10.60	10.90
	Total	36	52	132	220
	Percentage	16.36	23.63	60.00	
Retroversions.	Regular from the first	32	51	104	187
	Percentage	80.00	83.60	83.20	82.75
	Regular afterwards	4	7	14	25
	Percentage	10.00	11.47	11.20	11.06
	Never regular	4	3	7	14
	Percentage	10.00	4.91	5.60	6.19
	Total	40	61	125	226
	Percentage	17.69	26.99	55.31	
Lateral versions.	Regular from the first	1	8	2	11
	Percentage	100.00	80.00	40.00	68.75
	Regular afterwards	....	2	2	4
	Percentage	....	20.00	40.00	25.00
	Never regular	....	....	1	1
	Percentage	....	....	20.00	6.25
	Total	1	10	5	16
	Percentage	6.25	62.50	31.25	

It is shown by Table XXI. that of those who had anteversion and suffered from pain at the beginning of the flow, 75.86 per cent. were fruitful afterwards. The only explanation which can be offered in the present state of our knowledge, is in the supposition that flexure of the cervix at first existed. We shall see hereafter that pain at the beginning of the menstrual flow, but which ceases as soon as this becomes established, is almost characteristic of this form of flexure. Observation has shown that with elongated cervix the position of the uterus is frequently changed from an anteversion to a retroversion, before the flexure has become permanent. We have learned also that, with uncomplicated version of the uterus, if dysmenorrhœa exists, the pain is experienced almost without exception during the time of the flow.

Fifty-two and a half per cent. of those who at puberty had pain during the flow were sterile in after life. By reference to Table V. page 157, we will see that this is almost the same proportion as was found for sterile women on the general average. In other words, it was found that, of all women, who at puberty had suffered pain during the flow, more than half proved to be sterile in after life. As this average is rather less than the general one, we cannot, from the character of the pain alone, accept it as evidence that the version, if it then existed, was the cause of the dysmenorrhœa.

Sixty-eight and sixty-three one-hundredths per cent. of all women who had anteversions in after life had been free from pain at puberty, and of these, 66.88 per cent. were fruitful.

It was found that the proportion of fruitful women who had pain at the beginning of the flow, and suffered in after life with retroversion or anteversion, was greater than for either the sterile or unmarried. For those with pain during the flow, the proportion was greater for the sterile and unmarried, although the pain was not so great. In a similar manner, it will be seen that, of those free from pain, the proportion was greatest for the fruitful women. It will be noticed that 75.66 per cent. of those with retroversion had no pain at the beginning of menstrual life, this being a much larger proportion, under the same circumstances, than was found even for those having anteversion. Only 15.04 per cent. suffered pain during the flow at puberty; and finally 82.75 per cent. of these cases were regular without delay. These facts are additional indications, in support of the supposition which has already been advanced, that retroversions take place, as a rule, after puberty; it being well known that when a retroversion is detected in after life, painful menstruation is then the rule. In fact with these cases suffering from retroversion, the proportion of those with pain during the flow is far greater even than that given for the number who menstruated for the first time without pain. It cannot be supposed that retroversion could exist so many years without having,

TABLE XXI.—*Versions of the Uterus in Connection with the Regularity, Pain, and Length of the Menstrual Flow.*

		MENSTRUATION REGULAR FROM THE FIRST.								REGULAR AFTERWARDS.							
		Single.		Sterile.		Fruitful.		Total.		Single.		Sterile.		Fruitful.		Total.	
		No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.
Anteversions.	With pain at the beginning of the flow	....	....	3	15.00	17	85.00	20	....	....	....	3	50.00	3	50.00	6	....
	Average length of flow (in days)	....	....	4.33	....	4.58	....	4.55	....	....	....	5.00	....	4.00	....	4.50	....
	With pain during the flow	7	30.42	11	60.87	2	8.69	23	....	3	37.50	3	37.50	2	25.00	8	....
	Average length of flow (in days)	5.14	....	5.57	....	6.00	....	4.87	....	3.66	....	5.00	....	6.00	....	4.75	....
	Free from pain	18	15.38	23	19.65	76	64.95	117	....	2	9.09	2	9.09	18	81.81	22	....
	Average length of flow (in days)	5.38	....	4.60	....	5.17	....	5.09	....	6.50	....	5.00	....	5.94	....	5.90	....
	Total number of anteversions	25	15.62	40	25.00	95	59.37	160	72.72	5	13.88	8	22.22	23	63.88	36	16.36
	Average length of flow (in days)	5.32	..	4.57	....	5.08	....	4.99		4.80	....	5.00	....	5.69	....	5.41	....
Retroversions.	With pain at the beginning of the flow	2	14.28	6	42.85	6	42.85	14	....	....	....	3	60.00	2	40.00	5	....
	Average length of flow (in days)	5.00	....	2.83	....	4.83	....	4.00	....	....	....	7.00	....	4.00	....	5.80	....
	With pain during the flow	6	25.00	11	45.83	7	29.16	24	....	4	66.66	1	16.66	1	16.66	6	....
	Average length of flow (in days)	4.66	....	5.00	....	5.14	....	4.98	....	5.50	....	7.00	....	6.00	....	5.83	....
	Free from pain	94	16.10	34	22.82	91	61.07	149	....	....	....	3	21.42	11	78.57	14	....
	Average length of flow (in days)	4.33	....	4.00	....	5.14	....	4.73	....	....	....	5.33	....	4.63	....	4.78	....
	Total number of retroversions	32	17.11	51	27.27	104	55.61	187	82.75	4	16.00	7	28.00	14	56.00	25	11.06
	Average length of flow (in days)	4.43	....	4.07	....	5.12	....	4.72	....	5.50	....	6.28	....	4.64	....	5.24	....

		NEVER REGULAR.								SUMMARY.[1]							
		Single.		Sterile.		Fruitful.		Total.		Single.		Sterile.		Fruitful.		Total.	
		No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases and length of flow.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	Total No. of versions.	Percentage on total number.
Anteversions.	With pain at the beginning of the flow	1	33.33	....	....	2	66.66	3	....	1	3.44	6	20.69	22	75.86	29	13.18
	Average length of flow (in days)	4.00	....	....	....	3.50	....	3.66	....	4.00	....	4.63	....	4.40	....	4.44	
	With pain during the flow.	....	....	4	44.44	5	55.55	9	....	10	25.00	21	52.50	9	22.50	40	18.18
	Average length of flow (in days)	....	....	6.25	....	4.20	....	5.11	....	4.70	....	4.95	....	5.00	....	4.90	
	Free from pain........................	5	41.66	....	....	7	58.33	12	....	25	16.55	25	16.55	101	66.88	151	68.63
	Average length of flow (in days)	5.40	....	....	....	5.71	....	5.58	....	4.48	....	4.61	....	5.34	....	5.25	
	Total number of anteversions........	6	25.00	4	16.66	14	58.33	24	10.90	36	16.36	52	23.63	132	60.00	220	
	Average length of flow (in days)......	5.16	....	6.25	....	4.85	....	5.16	....	5.22	....	4.77	....	5.16	....	5.58	
Retroversions.	With pain at the beginning of the flow	....	....	....	....	2	100.	2	....	2	9.52	9	42.85	10	47.62	21	9.29
	Average length of flow (in days).....	....	....	....	....	5.50	....	5.50	....	5.00	....	4.22	....	4.80	....	4.57	
	With pain during the flow...........	2	50.00	1	25.00	1	25.00	4	....	12	35.29	13	38.23	9	36.47	34	15.04
	Average length of flow (in days)	5.00	....	3.00	....	6.00	....	4.75	....	5.00	....	5.00	....	5.33	....	5.08	
	Free from pain	2	25.00	2	25.00	4	50.00	8	....	26	15.20	39	29.80	106	61.98	171	75.66
	Average length of flow (in days)	4.00	....	7.50	....	3.75	....	4.75	....	4.30	....	4.28	....	5.03	....	4.75	
	Total number of retroversions	4	28.57	3	21.42	7	50.00	14	6.19	40	17.60	61	26.99	125	55.31	226	
	Average length of flow (in days)......	4.50	....	6.00	....	4.57	....	4.85	....	4.55	....	4.42	....	5.04	....	4.78	

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[1] Of all women having anteversion, with pain at the beginning, one, or 3.44 per cent., were single; six, or 20.69 per cent., were sterile; and twenty-two, or 75.86 per cent., were fruitful, etc. etc. Although not shown in the table it may be stated that of the single women who had *anteversion* 2.77 per cent. had pain at the beginning; 27.77 per cent. during the flow; and 69.44 per cent. were free from pain. Of the sterile 11.53 per cent. had pain at the beginning; 40.38 during the flow; 48.07 free from pain. Of the fruitful 16.66 had pain at the beginning; 6.81 during the flow; 76.51 free from pain. Of the single women who had *retroversion*, 5.00 per cent. had pain at the beginning; 30.50 during the flow; 65.00 free from pain. Of the sterile 14.75 had pain at the beginning; 21.31 during the flow; 63.43 free from pain. Of the fruitful 8.00 had pain at the beginning; 7.20 during the flow; 84.80 free from pain.

TABLE XXII.—*Showing the Condition of Menstruation in After-life, where Versions of the Uterus existed.*

The Average length of flow is expressed in days.			MENSTRUATION UNCHANGED IN LENGTH.															
			Length of flow remained unchanged from the beginning, as to time or quantity, being								Length of flow remained unchanged, but the quantity became afterwards							
			Normal.		Too free,		Scanty.		Total.		Increased.		Lessened,		Irregular.		Total.	
			No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.
Anteversions.	Unmarried	Number of cases	10	58.82	3	17.64	4	23.52	17	47.22	....	....	4	57.14	3	42.85	7	19.44
		Percentage	25.00	....	25.00	....	30.77	....	26.15	....	....	....	13.33	....	25.00	....	9.45	....
		Average length of flow	5.20	....	7.33	....	4.00	....	5.29	....	....	....	4.75	....	4.66	....	4.71	....
	Sterile	Number of cases	11	68.75	3	18.75	2	12.50	16	30.76	5	31.25	9	56.25	2	12.50	16	30.76
		Percentage	27.50	....	25.00	....	15.38	....	24.61	....	15.62	....	30.00	....	16.66	....	21.62	....
		Average length of flow	5.09	....	7.66	....	6.00	....	5.68	....	5.00	....	4.88	....	4.00	....	4.81	....
	Fruitful	Number of cases	19	59.37	6	18.75	7	21.87	32	24.24	27	52.94	17	33.33	7	13.72	51	38.63
		Percentage	47.50	....	50.00	....	53.84	....	49.23	....	84.37	....	56.66	....	58.33	....	68.91	....
		Average length of flow	5.10	....	6.33	....	2.14	....	4.68	....	5.55	....	4.88	....	3.43	....	5.03	....
	Total	Number of cases	40	61.53	12	18.46	13	20.00	63	29.54	32	43.24	30	40.54	12	16.21	74	33.63
		Average length of flow	5.12	...	6.91	....	3.30	....	5.09	....	5.47	....	4.86	....	3.83	...	4.95	....
Retroversions.	Unmarried	Number of cases	17	73.91	2	8.69	4	17.37	23	57.50	3	50.00	2	33.33	1	16.66	6	15.00
		Percentage	26.56	....	15.38	....	25.00	....	24.73	....	9.67	....	7.69	....	9.09	....	8.80	....
		Average length of flow	4.70	....	7.00	....	1.75	....	4.39	....	6.63	....	5.00	....	3.03	....	5.50	....
	Sterile	Number of cases	18	60.00	5	16.66	7	23.33	30	49.18	7	43.75	6	37.50	3	18.75	16	26.22
		Percentage	28.12	....	38.45	....	43.75	....	32.25	....	22.58	....	23.07	....	27.27	...	23.53	....
		Average length of flow	4.33	....	6.60	....	4.26	....	4.70	....	3.71	....	5.50	....	3.66	....	4.37	....
	Fruitful	Number of cases	29	72.50	6	15.00	5	12.50	40	32.00	21	45.65	18	39.13	7	15.21	46	36.80
		Percentage	45.31	....	46.15	....	31.25	....	43.01	....	67.74	....	69.23	....	63.62	....	67.64	....
		Average length of flow	4.79	....	6.66	....	2.00	....	4.72	....	5.62	....	4.77	....	4.83	....	5.17	....
	Total	Number of cases	64	68.81	13	13.97	16	17.20	93	41.15	31	45.58	26	38.23	11	16.17	68	30.08
		Average length of flow	4.64	....	6.69	....	2.93	....	4.63	....	5.29	....	4.96	....	4.36	....	5.01	....

TABLE XXII.—*Continued.*

The Average length of flow is expressed in days.			MENSTRUATION CHANGED BOTH IN LENGTH AND QUANTITY.																Grand total.
			Length of flow increased, with the quantity, either								Length of flow lessened, with the quantity, either								
			Increased,		Lessened,		Irregular.		Total.		Lessened,		Increased,		Irregular.		Total.		
			No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	
Anteversions.	Unmarried	Number of cases.........	7	87.50	1	12.50	....	....	8	22.22	4	1.00	....	....	....	....	4	11.11	36
		Percentage	18.91	....	33.33	....	....	....	18.15	....	12.12	....	....	....	....	....	10.81	....	
		Average length of flow ..	6.28	....	7.00	....	....	....	6.37	....	3.50	....	....	....	....	....	3.50	....	5.22
	Sterile.....	Number of cases.........	8	88.88	....	....	1	11.11	9	17.30	10	90.90	....	....	1	9.09	11	21.15	52
		Percentage	21.62	....	....	....	25.00	....	20.45	....	30.30	....	....	....	33.33	....	24.72	....	
		Average length of flow ..	6.62	....	....	....	3.00	....	6.22	....	2.50	....	....	....	2.00	....	4.45	....	4.82
	Fruitful....	Number of cases.........	22	81.48	2	7.40	3	11.11	27	20.45	19	86.36	1	4.55	2	9.09	22	16.66	132
		Percentage	59.47	....	66.66	....	75.00	....	61.36	....	57.57	....	100.	....	66.66	....	59.46	....	
		Average length of flow ..	6.86	....	6.50	....	6.33	....	6.77	....	3.73	....	3.00	....	5.00	....	3.81	....	5.10
	Total	Number of cases.........	37	84.09	3	6.81	4	9.09	44	20.00	33	89.18	1	2.70	3	8.10	37	16.81	220
		Average length of flow ..	6.70	....	6.66	....	5.50	....	6.59	....	3.33	....	3.00	....	4.00	....	3.37	....	5.05
Retroversions.	Unmarried	Number of cases.........	3	50.00	....	....	3	50.00	6	15.00	5	100.	....	....	....	....	5	12.50	40
		Percentage	13.04	....	....	....	60.00	....	19.34	....	14.70	....	....	....	....	....	14.70	....	
		Average length of flow ..	5.66	....	....	....	5.66	....	5.66	....	2.80	....	....	....	....	....	2.80	....	4.55
	Sterile.....	Number of cases.........	2	50.00	1	25.00	1	25.00	4	6.55	11	100.	....	....	....	....	11	18.03	61
		Percentage	8.69	....	33.33	....	20.00	....	12.90	....	32.35	....	....	....	....	....	32.35	....	
		Average length of flow ..	5.50	....	7.00	....	7.00	....	5.25	....	3.00	....	....	....	....	....	3.00	....	4.40
	Fruitful....	Number of cases.........	18	85.71	2	9.52	1	4.76	21	16.80	18	100.	....	....	....	....	18	14.40	125
		Percentage	78.26	....	66.66	....	20.00	....	67.74	....	52.94	....	....	....	....	....	52.94	....	
		Average length of flow ..	6.88	....	6.50	....	10.00	....	7.00	....	3.33	....	....	....	....	....	3.33	....	5.07
	Total	Number of cases.........	23	74.19	3	9.67	5	16.13	31	13.71	34	100.	....	....	....	....	34	15.04	226
		Average length of flow ..	6.60	....	6.66	....	6.80	....	6.64	....	3.14	....	....	....	....	....	3.14	....	4.80

TABLE XXII.—*Showing the Condition of Menstruation in After-life, where Versions of the Uterus existed.*

The Average length of flow is expressed in days.			MENSTRUATION UNCHANGED IN LENGTH.															
			Length of flow remained unchanged from the beginning, as to time or quantity, being								Length of flow remained unchanged, but the quantity became afterwards							
			Normal,		Too free,		Scanty.		Total.		Increased,		Lessened,		Irregular.		Total.	
			No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No of cases.	Per cent.
Anteversions.	Unmarried	Number of cases	10	58.82	3	17.64	4	23.52	17	47.22	....	....	4	57.14	3	42.85	7	19.44
		Percentage	25.00	....	25.00	....	30.77	....	26.15	....	....	....	13.33	....	25.00	....	9.45	....
		Average length of flow	5.20	....	7.33	....	4.00	....	5.29	....	....	....	4.75	....	4.66	....	4.71	....
	Sterile	Number of cases	11	68.75	3	18.75	2	12.50	16	30.76	5	31.25	9	56.25	2	12.50	16	30.76
		Percentage	27.50	....	25.00	....	15.38	....	24.61	....	15.62	....	30.00	....	16.66	....	21.62	....
		Average length of flow	5.00	....	7.66	....	6.00	....	5.68	....	5.00	....	4.88	....	4.00	....	4.81	....
	Fruitful	Number of cases	19	59.37	6	18.75	7	21.87	32	24.24	27	52.94	17	33.33	7	13.72	51	38.63
		Percentage	47.50	....	50.00	....	53.84	....	49.23	....	84.37	....	56.66	....	58.33	....	68.91	....
		Average length of flow	5.10	....	6.33	....	2.14	....	4.68	....	5.55	....	4.88	....	3.43	....	5.03	....
	Total	Number of cases	40	61.53	12	18.46	13	20.00	65	29.54	32	43.24	30	40.54	12	16.21	74	33.63
		Average length of flow	5.12	...	6.91	....	3.30	....	5.09	....	5.47	....	4.56	....	3.53	.. .	4.95	....
Retroversions.	Unmarried	Number of cases	17	73.91	2	8.69	4	17.37	23	57.50	3	50.00	2	33.33	1	16.63	6	15.00
		Percentage	26.56	. ..	15.38	....	25.00	....	24.73	....	9.67	....	7.69	....	9.09	....	8.80	....
		Average length of flow	4.70	....	7.00	....	1.75	....	4.39	....	6.63	....	5.00	....	3.03	....	5.50	....
	Sterile	Number of cases	18	60.00	5	16.66	7	23.33	30	40.18	7	43.75	6	37.50	3	18.75	16	26.22
		Percentage	28.12	....	38.45	....	43.75	....	32.25	....	22.58	....	23.07	....	27.27	..	23.53	....
		Average length of flow	4.33	....	6.60	....	4.25	....	4.70	....	3.71	....	5.00	....	3.66	....	4.37	....
	Fruitful	Number of cases	29	72.50	6	15.00	5	12.50	40	32.00	21	45.65	18	39.13	7	15.21	46	36.80
		Percentage	45.31	....	46.15	....	31.25	....	43.01	....	67.74	....	69.23	....	63.63	....	67.64	....
		Average length of flow	4.79	....	6.66	....	2.00	....	4.72	....	5.62	....	4.77	....	4.83	....	5.17	....
	Total	Number of cases	64	65.81	13	13.97	16	17.20	93	41.15	31	45.58	26	38.23	11	16.17	68	30.08
		Average length of flow	4.64	....	6.69	....	2.93	....	4.63	....	5.29	....	4.96	....	4.36	....	5.01	....

TABLE XXII.—*Continued.*

The Average length of flow is expressed in days.			MENSTRUATION CHANGED BOTH IN LENGTH AND QUANTITY.																Grand total.
			Length of flow increased, with the quantity, either								Length of flow lessened, with the quantity, either								
			Increased,		Lessened,		Irregular.		Total.		Lessened,		Increased,		Irregular.		Total.		
			No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	
Anteversions.	Unmarried	Number of cases.........	7	87.50	1	12.50	....	....	8	22.22	4	1.00	....	....	....	....	4	11.11	36
		Percentage	18.91	....	33.33	....	....	....	18.15	....	12.12	....	....	....	....	....	10.81	....	
		Average length of flow ..	6.28	....	7.00	....	....	....	6.37	....	3.50	....	....	....	....	....	3.50	....	5.22
	Sterile.....	Number of cases.........	8	88.88	....	....	1	11.11	9	17.30	10	90.90	....	....	1	9.09	11	21.15	52
		Percentage	21.62	....	....	....	25.00	....	20.45	....	30.30	....	....	....	33.33	....	24.72	....	
		Average length of flow ..	6.62	....	....	....	3.00	....	6.22	....	2.50	....	....	....	2.00	....	4.45	....	4.82
	Fruitful....	Number of cases.........	22	81.48	2	7.40	3	11.11	27	20.45	19	86.36	1	4.55	2	9.09	22	16.66	132
		Percentage	59.47	....	66.66	....	75.00	....	61.36	....	57.57	....	100.	....	66.66	....	59.46	....	
		Average length of flow ..	6.86	....	6.50	....	6.33	....	6.77	....	3.73	....	3.00	....	5.00	....	3.81	....	5.10
	Total....	Number of cases.........	37	84.09	3	6.81	4	9.09	44	20.00	33	89.18	1	2.70	3	8.10	37	16.81	220
		Average length of flow ..	6.70	....	6.66	....	5.50	....	6.59	....	3.33	....	3.00	....	4.00	....	3.37	....	5.05
Retroversions.	Unmarried	Number of cases.........	3	50.00	....	....	3	50.00	6	15.00	5	100.	....	....	....	....	5	12.50	40
		Percentage	13.04	....	....	....	60.00	....	19.34	....	14.70	....	....	....	....	....	14.70	....	
		Average length of flow ..	5.66	....	....	....	5.66	....	5.66	....	2.50	....	....	....	....	....	2.80	....	4.55
	Sterile.....	Number of cases.........	2	50.00	1	25.00	1	25.00	4	6.55	11	100.	....	....	....	....	11	18.03	61
		Percentage	8.69	....	33.33	....	20.00	....	12.90	....	32.35	....	....	....	....	....	32.35	....	
		Average length of flow ..	5.50	....	7.00	....	7.00	....	5.25	....	3.00	....	....	....	....	....	3.00	....	4.40
	Fruitful....	Number of cases.........	18	85.71	2	9.52	1	4.76	21	16.80	18	100.	....	....	....	....	18	14.40	125
		Percentage	78.26	....	66.66	....	20.00	....	67.74	....	52.94	....	....	....	....	....	52.94	....	
		Average length of flow ..	6.88	....	6.50	....	10.00	....	7.00	....	3.33	....	....	....	....	....	3.33	....	5.07
	Total....	Number of cases.........	23	74.19	3	9.67	5	16.13	31	13.71	34	100.	....	....	....	....	34	15.04	226
		Average length of flow ..	6.60	....	6.66	....	6.80	....	6.64	....	3.14	....	....	....	....	....	3.14	....	4.80

TABLE XXII.—*Showing the Condition of Menstruation in After-life, where Versions of the Uterus existed.*

The Average length of flow is expressed in days.		Menstruation Unchanged in Length.															
		Length of flow remained unchanged from the beginning, as to time or quantity, being								Length of flow remained unchanged, but the quantity became afterwards							
		Normal.		Too free.		Scanty.		Total.		Increased.		Lessened.		Irregular.		Total.	
		No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.
Anteversions. Unmarried	Number of cases	10	58.82	3	17.64	4	23.52	17	47.22	....	....	4	57.14	3	42.85	7	19.44
	Percentage	25.00	....	25.00	....	30.77	....	26.15	....	....	....	13.33	....	25.00	....	9.45	....
	Average length of flow	5.20	....	7.33	....	4.00	....	5.29	....	....	....	4.75	....	4.66	....	4.71	....
Sterile	Number of cases	11	68.75	3	18.75	2	12.50	16	30.76	5	31.25	9	56.25	2	12.50	16	30.76
	Percentage	27.50	....	25.00	....	15.38	....	24.61	....	15.62	....	30.00	....	16.66	....	21.62	....
	Average length of flow	5.09	....	7.66	....	6.00	....	5.68	....	5.00	....	4.58	....	4.00	....	4.61	....
Fruitful	Number of cases	19	59.37	6	18.75	7	21.87	32	24.24	27	52.94	17	33.33	7	13.72	51	38.63
	Percentage	47.50	....	50.00	....	53.84	....	49.23	....	84.37	....	56.66	....	58.33	....	68.91	....
	Average length of flow	5.10	....	6.33	....	2.14	....	4.68	....	5.55	....	4.88	....	3.43	....	5.03	....
Total	Number of cases	40	61.53	12	18.46	13	20.00	65	29.54	32	43.24	30	40.54	12	16.21	74	33.63
	Average length of flow	5.12	...	6.91	....	3.30	....	5.09	....	5.47	....	4.86	....	3.83	.. .	4.95	....
Retroversions. Unmarried	Number of cases	17	73.91	2	8.69	4	17.37	23	57.50	3	50.00	2	33.33	1	16.66	6	15.00
	Percentage	26.56	. ..	15.38	....	25.00	....	24.73	....	9.67	....	7.69	....	9.09	....	8.80	....
	Average length of flow	4.70	....	7.00	....	1.75	....	4.39	....	6.63	....	5.00	....	3.00	....	5.50	....
Sterile	Number of cases	18	60.00	5	16.66	7	23.33	30	49.18	7	43.75	6	37.50	3	18.75	16	26.22
	Percentage	28.12	....	38.45	....	43.75	....	32.25	....	22.58	....	23.07	....	27.27	..	23.53	....
	Average length of flow	4.33	....	6.60	....	4.28	....	4.70	....	3.71	....	5.50	....	3.66	....	4.37	....
Fruitful	Number of cases	29	72.50	6	15.00	5	12.50	40	32.00	21	45.65	18	39.13	7	15.21	46	36.80
	Percentage	45.31	....	46.15	....	31.25	....	43.01	....	67.74	....	69.23	....	63.62	....	67.64	....
	Average length of flow	4.79	....	6.66	....	2.00	....	4.72	....	5.62	....	4.77	....	4.83	....	5.17	....
Total	Number of cases	64	66.81	13	13.97	16	17.20	93	41.15	31	45.58	26	38.23	11	16.17	68	30.08
	Average length of flow	4.64	....	6.60	....	2.03	....	4.63	....	5.29	....	4.90	....	4.36	....	5.01	....

TABLE XXII.—*Continued.*

The Average length of flow is expressed in days.			Menstruation Changed both in Length and Quantity.																Grand total.
			Length of flow increased, with the quantity, either								Length of flow lessened, with the quantity, either								
			Increased,		Lessened,		Irregular.		Total.		Lessened,		Increased,		Irregular.		Total.		
			No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	
Anteversions.	Unmarried	Number of cases	7	87.50	1	12.50	....	....	8	22.22	4	1.00	....	....	....	....	4	11.11	36
		Percentage	18.91	....	33.33	....	....	....	18.15	....	12.12	....	....	....	....	....	10.81	....	
		Average length of flow	6.28	....	7.00	....	....	....	6.37	....	3.50	....	....	....	....	....	3.50	....	5.22
	Sterile	Number of cases	8	88.88	....	....	1	11.11	9	17.30	10	90.90	....	....	1	9.09	11	21.15	52
		Percentage	21.62	....	....	....	25.00	....	20.45	....	30.30	....	....	....	33.33	....	24.72	....	
		Average length of flow	6.62	....	....	....	3.00	....	6.22	....	2.50	....	....	....	2.00	....	4.45	....	4.82
	Fruitful	Number of cases	22	81.48	2	7.40	3	11.11	27	20.45	19	86.36	1	4.55	2	9.09	22	16.66	132
		Percentage	59.47	....	66.66	....	75.00	....	61.36	....	57.57	....	100.	....	66.66	....	59.46	....	
		Average length of flow	6.86	....	6.50	....	6.33	....	6.77	....	3.73	....	3.00	....	5.00	....	3.51	....	5.10
	Total	Number of cases	37	84.09	3	6.81	4	9.09	44	20.00	33	89.18	1	2.70	3	8.10	37	16.81	220
		Average length of flow	6.70	....	6.66	....	5.50	....	6.50	....	3.33	....	3.00	....	4.00	....	3.37	....	5.05
Retroversions.	Unmarried	Number of cases	3	50.00	....	....	3	50.00	6	15.00	5	100.	....	....	....	....	5	12.50	40
		Percentage	13.04	....	....	....	60.00	....	19.34	....	14.70	....	....	....	....	....	14.70	....	
		Average length of flow	5.66	....	....	....	5.66	....	5.66	....	2.50	....	....	....	....	....	2.80	....	4.55
	Sterile	Number of cases	2	50.00	1	25.00	1	25.00	4	6.55	11	100.	....	....	....	....	11	18.03	61
		Percentage	8.69	....	33.33	....	20.00	....	12.90	....	32.35	....	....	....	....	....	32.35	....	
		Average length of flow	5.50	....	7.00	....	7.00	....	5.25	....	3.00	....	....	....	....	....	3.00	....	4.40
	Fruitful	Number of cases	18	85.71	2	9.52	1	4.76	21	16.80	18	100.	....	....	....	....	18	14.40	125
		Percentage	78.26	....	66.66	....	20.00	....	67.74	....	52.94	....	....	....	....	....	52.94	....	
		Average length of flow	6.88	....	6.50	....	10.00	....	7.00	....	3.33	....	....	....	....	....	3.33	....	5.07
	Total	Number of cases	23	74.19	3	9.67	5	16.13	31	13.71	34	100.	....	....	....	....	34	15.04	226
		Average length of flow	6.60	....	6.66	....	6.80	....	6.64	....	3.14	....	....	....	....	....	3.14	....	4.50

as a consequence of the malposition, a condition or disease established which would have sooner called for relief. This we must admit, or hold that the displacement is in itself of little consequence unless some other condition coexists.

The length of period at and after puberty is also shown in Table XXI. For both forms of version, with pain at the beginning of the flow, the length of period was less than that shown by Table II., page 155, for the general average. When pain existed during the flow the average duration was much less for anteversion, and a trifle more for retroversion, by the same standard. For those women who did not suffer pain, these averages were reversed. On all cases of anteversion the average duration was greater than the general one taken on all women under observation, while the reverse was true for the total number of retroversions, and for each class of women with retroversion, except the fruitful, with whom the duration of the flow was longer.

On account of the small number of lateral versions (sixteen) they were not included with the other displacements in Table XXII. Any deductions drawn from statistics based on so small a number would be of little value if they did not fully confirm, as they however do, those already drawn from a study of the other displacements. Thus of the sixteen women with lateral version one, or 6.25 per cent., had pain at the beginning of the flow; four, or 25 per cent., during the flow; and eleven, or 68.75 per cent., were free from pain at puberty. Eleven, or 68.75 per cent., were regular from the first; four, or 25 per cent., were so after a certain time; and one, or 6.25 per cent., was never regular. The average length of menstruation, with pain in the beginning of the flow, was four days; with pain during the flow four days; and for those who were free from pain 4.90 days. Those who were regular from the first, menstruated on an average 5 days, and for those who became regular afterwards, the average was only 3.50 days, much less than that for the same conditions with either of the other forms of version. Five days was the average length for the only woman who was never regular, and the average for all cases of lateral version was 4.62 days. Of the total number, one, or 6.25 per cent., was unmarried; eleven, or 68.75 per cent., were sterile; and four, or 25 per cent., were fruitful in after life.

Table XXII. is designed to show the after changes in menstruation, particularly as to the length of flow. The first impression is one of surprise that the averages on the total number should exhibit so little change in the length of the flow, seeing that the extremes are two and ten days. If we consult Table XII., which shows the after changes in menstruation, and which was made up from all the women under observation, without reference to versions or to disease, the same general average will be observed. We may note in practice great changes in the amount of flow, but after the habit as to time has been once formed, the average length will vary but little, unless the circulation should have been affected by a new growth.

Two divisions have been made in the table, and these are again subdivided. The first is composed of those with whom the length of period remained unchanged in after life. In the second are those with whom both length and quantity became changed. The first division is made up of two classes: in the one, menstruation, whether normal, too free, or scanty, remained unchanged both in length and quantity, while in the other, length only remained unchanged, but the quantity became increased, lessened, or irregular. The length of the flow of those forming the first class of the second division became increased, while the quantity was increased, lessened, or became irregular. In the second class the length of flow became lessened, while the quantity lessened, increased, or became irregular.

In connection with what has been already stated, regarding the changes in the length of the menstrual flow, it will be of interest to note that those forming 63.18 per cent. of the cases of anteversion and 58.44 per cent. of the retroversions remained unchanged. Of the first subdivision 29.54 per cent. of the anteversions, and 41.15 per cent. of the retroversions underwent in after life no change in either length of flow or in quantity. There are many points of interest, if not of practical importance, given in this table, particularly in the comparative percentages between the unmarried, sterile, and fruitful women.

Table XXIII. is a summary of the preceding one, giving the changes of menstruation for both forms of version, without reference to the social condition. That menstruation, as is shown by this table, should remain normal, without change in either length or quantity of flow, in so large a proportion of cases suffering from retroversion, is a circumstance for which no explanation can be offered. It is even more surprising that the proportion of normally menstruating women with this form of displacement should be much greater than is found for those with anteversion.

If these data teach us anything, it is that these displacements are not common or frequent at the time of puberty, and that, if they are, the mere position of the uterus is of little moment when no complication exists.

TABLE XXIII.—*Changes of Menstruation for both forms of Version.*

		LENGTH OF MENSTRUATION UNCHANGED.								TOTAL.			CHANGED IN BOTH LENGTH AND QUANTITY.								TOTAL.			SUMMARY.		
		Flow remained unchanged, as to length and quantity, being from the beginning either				Length of flow remained unchanged, but the quantity became afterwards, either							Length of flow increased, with the quantity either				Length of flow lessened, with the quantity either									
		Normal.	Too free.	Scanty.	Total.	Increased.	Lessened.	Irregular.	Total.	No. of cases.	Average length of flow.	Per cent. for each condition.	Increased.	Lessened.	Irregular.	Total.	Lessened.	Increased.	Irregular.	Total.	No. of cases.	Average length of flow.	Per cent. for each condition.	No. of cases.	Average length of flow.	Per cent. for each condition.
For anteversions.	Normal	40	..	..	..	..	..	..	..	40	5.12	23.77	..	..	..	..	..	..	..	..	..	..	..	40	5.12	18.18
	Scanty	..	..	13	..	..	..	..	..	13	3.30	9.35	..	..	..	..	..	..	..	..	..	..	..	13	3.30	5.90
	Too free, or increased	..	12	..	..	32	..	..	..	44	5.86	31.65	37	..	..	..	..	1	..	..	38	6.60	46.91	82	6.20	37.27
	Lessened	..	..	..	..	..	30	..	..	30	4.86	21.57	..	3	..	..	33	..	..	..	36	3.61	44.44	66	4.18	30.00
	Irregular	..	..	..	..	..	..	12	..	12	3.83	8.63	..	..	4	..	..	..	3	..	7	4.85	8.64	19	4.21	8.63
	Total	..	..	..	65	..	..	..	74	139	5.11	..	..	..	..	44	..	..	..	37	81	5.12	..	220	5.05	
	Percentage on all conditions	18.18	5.45	5.90	..	14.54	13.63	5.45	..	..	..	..	16.81	1.36	1.81	..	15.00	.45	1.36							
For retroversions.	Normal	64	..	..	..	..	..	..	..	64	4.48	39.75	..	..	..	..	..	..	..	..	..	..	..	64	4.48	28.31
	Scanty	..	..	16	..	..	..	..	..	16	2.93	9.93	..	..	..	..	..	..	..	..	..	..	..	16	2.93	7.08
	Too free, or increased	..	13	..	..	31	..	..	..	44	5.70	27.32	23	..	..	..	..	..	..	..	23	6.60	35.38	67	6.01	29.65
	Lessened	..	..	..	..	..	26	..	..	26	4.96	16.14	..	3	..	..	34	..	..	..	37	3.43	56.92	63	4.05	27.87
	Irregular	..	..	..	..	..	..	11	..	11	4.36	6.83	..	..	5	..	..	..	..	..	5	6.80	7.69	16	5.12	7.08
	Total	..	..	..	93	..	..	..	68	161	4.73	..	..	..	..	31	..	..	..	34	65	4.81	..	226	4.80	
	Percentage on all conditions	28.31	5.75	7.08	..	13.71	11.50	4.86	..	..	..	..	10.17	1.32	2.21	..	15.04									

An extreme degree of anteversion can and does frequently exist as a natural position for some uteri, without producing the slightest inconvenience, unless the organ becomes enlarged, from some obstruction to its circulation, and begins to prolapse. These tables show, as we have seen, that a large proportion of retroversions can exist without any change necessarily taking place in menstruation. Yet, complete displacement cannot long exist without producing some disturbance of the nervous system. From continued pressure of the cervix against the anterior wall of the vagina, reflex irritation is likely to be excited long before any diseased condition becomes established in the organ itself. This is the condition when the displacement has become complete, but the uterus does sometimes remain for years partially retroverted, without producing any disturbance. When the organ is retroverted, the woman is certainly more liable to disease than she would be were the uterus in a better position. But it is not until the circulation becomes disturbed by some accidental cause, and prolapse takes place, that the demand for relief becomes urgent. It is, therefore, not so much the version, as the prolapse which excites disturbance in the circulation. The effect of prolapse on the circulation has been shown on page 128, and that the same result follows any undue elevation of the organ in the pelvis was also shown. The fact that a certain number of cases, suffering from retroversion, should have the menstrual flow increased, while the effect with others should be to lessen it, may possibly excite some surprise. The condition of the flow as to quantity is determined almost entirely by the position of the uterus, and by the length of time during which the version has existed. When the displacement has not been extreme, and its origin is more recent, the flow is generally free. On the other hand, when the version has been of long standing, or the circulation has become very much obstructed, from the existing degree of displacement, the period becomes, almost without exception, scanty or irregular.

Treatment of Versions.—A version, as has been stated, may exist for an indefinite period without causing any disturbance, so long as the organ does not prolapse sufficiently to increase the existing obstruction to the circulation. Whenever prolapse has occurred to an extent calling for relief, two plans of treatment will be applicable. First, to correct the displacement and version, so far as can be done by mechanical means. Secondly, to relieve the local cause of disease. Under the proper head extraneous causes of version will be treated of, and we will now refer only to the management of what we have termed, in contradistinction, idiopathic version.

The local treatment should consist in the frequent and continued use of hot-water vaginal injections, and of appropriate applications to the uterine canal. To give tone to the bloodvessels is essential, and even if the loss of tone were confined to the uterus itself (which is rare) we possess no better way of accomplishing the purpose than through the action of the hot water on the pelvic vessels. The details of local and general treatment have already been so fully considered under the head of general principles, that, to avoid repetition, their application to individual forms of disease must be left to the judgment of the reader.

When mechanical means are applicable in the treatment of versions, we will accomplish more marked results in the prompt relief obtained, and do more towards the final restoration to health than by any other plan of procedure. Retroversion and prolapse are the only forms of displacement for the correction of which we possess any reliable, or, as a rule, safe mechanical means.

When the uterus falls forward, or to either side, we can only relieve the sagging, or prolapse of the organ in the pelvis, by mechanical means. I have for many years held the view that an anteversion of the uterus is not a mal-position; and that no degree of version will cause irritation of the bladder so long as the uterus remains in a healthy condition. But whenever the uterus becomes heavy from any cause, it will settle down in the pelvis, and the irritation produced will be in proportion to the amount of traction exerted along the anterior wall of the vagina. Vesical disturbance will occur as soon as the uterus reaches a point in the pelvis where traction is exerted directly on the neck of the bladder, and this occurs when either prolapse takes place or the uterus is dragged upward. I have verified, beyond question, the correctness of my view, that no degree of anteversion without prolapse produces disturbance, and that no relief is ever obtained by simply lifting the uterus to an upright position unless the prolapse is also corrected.

I have several times made a vesico-vaginal fistula for the relief of chronic cystitis in cases where the uterus was enlarged and anteverted. For a long time I was puzzled to account for the irritation and frequent desire to empty the bladder, which would continue after the operation, although I had satisfied myself that every drop of urine escaped through the artificial opening immediately after entering the bladder. I had also noticed the same irritation continue after the operation, when the uterus was retroverted. In both instances the original cause of the cystitis was the displacement of the uterus.

With the anteversion, the uterus was prolapsed, and dragged the vesico-vaginal septum downward until traction was made directly on the neck of the bladder. With the retroversion, the same effect was produced by the dragging of the neck of the bladder upward. The irritation of the bladder was not relieved until the prolapse was corrected by lifting the uterus, without regard to the version, and maintaining it in its proper place by an instrument. In the other instance the retroversion had to be corrected, and the traction upward on the neck of the bladder removed by a properly fitting pessary.

Various devices have been contrived, with the exercise of much ingenuity, for forcing the organ into an upright position, and to a point which, in all probability, it never occupied. Any instrument making direct pressure on the anterior wall of the uterus, which is the chief seat of disease, and usually very tender, must prove a source of irritation. Such a plan of treatment is faulty in theory, and pernicious in practice. When these instruments give any relief, the result is brought about simply by their lessening the degree of prolapse. Even in the hands of an expert, great harm sometimes results from their use, and as all benefit to be derived can be obtained by simpler and safer means, these instruments should cease to be so generally employed. If, by any appliance, we can lift the uterus to a point where the obstructed venous circulation through the neighboring tissues can be relieved, it is all that can be accomplished by such means.

Great relief may be obtained by even increasing the degree of anteversion through the use of a pessary with a long enough curve in the posterior cul-de-sac, so as to lift the neck of the organ from the floor of the pelvis. By thus slinging, as it were, the uterus with the fundus resting against the pubis, and the cervix elevated, the circulation will rapidly improve, and the irritability of the bladder be lessened. We will also gain time by this means, since it will enable the patient to take more out-door exercise; and, by the use of the pessary, we will break the force or jar which is transmitted with every step to the uterus, so long as the cervix rests on the floor of the pelvis.

The treatment of retroversion of the uterus is more satisfactory, mechanical means can be better applied, and the good resulting from relieving the obstructed circulation is well marked on restoring the organ to its natural position. A recent case of retroversion can be reduced with comparative ease, and an instrument may be readily adjusted, which will keep the organ so far anteverted that it cannot return to its former position. If, however, the displacement has been

flexed, the condition will,
irritation in causing cellu-
even when no adhesion has
have been kept up, which
establish a fresh attack of
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easily be mistaken for adhesions.
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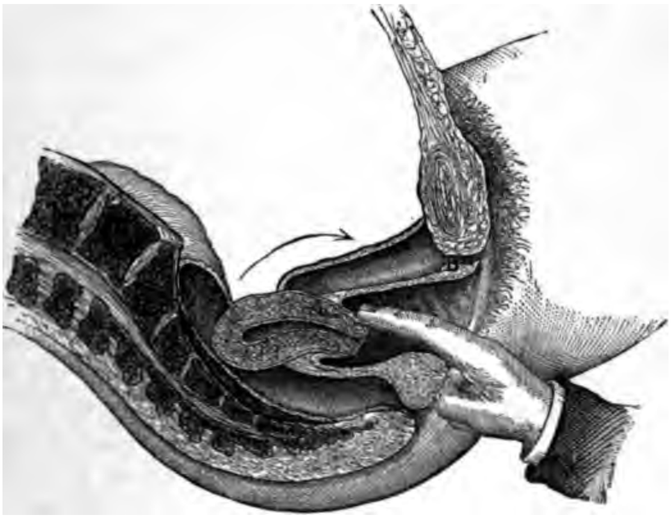
The utero-sacral ligaments, when not in a diseased condition, are scarcely worthy of note, as hindrances to a replacement of the uterus, since they consist only of a reduplication of the peritoneum, and a little cellular tissue. They, however, frequently become thickened from inflammation. Whenever the retroversion becomes complete, thickened ligaments partially close over the enlarged uterus, and often present an obstacle, which might easily be mistaken for adhesions, when we attempt to replace the organ.

A retroverted uterus may be restored to its natural position by the sound, the elevator, or the finger, or by means of position and atmospheric pressure.

If we can ascertain the fact or feel reasonably satisfied that neither adhesions nor lurking inflammation exist in the neighboring cellular tissue, we may, with comparative safety, lift the uterus with the sound or any other means to which we have been accustomed. The use of the sound, however, for this purpose, almost always produces pain, and can never be regarded, even in the most skilful hands, as a means free from risk. The use of the elevator has already been fully described, and with ordinary care and dexterity, the instrument may be deemed safe, and should cause but little or no pain. The effect and employment of atmospheric pressure has also been fully considered.

I have long accustomed myself to rely on the use of the index finger for lifting a retroverted uterus into place, and, with a little practice, it becomes our most reliable means. It is one certainly attended with the least risk, as we are able to appreciate at once, in cases of adhesions, the point and extent of resistance. For employing this method the patient is to be placed on the back, with the knees flexed, and the hips drawn down to the edge of the operating table or chair. Introduce then the index finger into the vagina, and direct the point of the tenaculum so that it may be hooked into the posterior lip just within the os. The instrument is to be used for the purpose of gently drawing forward the organ sufficiently toward the vaginal outlet, until we are satisfied that the fundus is distant enough from the hollow of the sacrum to pass the promontory when elevated. At the first attempt this manipulation must be done with care, and, if a point is reached at which great pain is produced, we must desist. By this manœuvre the uterus, of course, becomes more retroverted than before. To correct this, the perineum should be pressed firmly back, that the finger in the vagina may be passed up as far behind the uterus as possible, and made, at the same time, to lift the organ. When the fundus of the uterus has been thus elevated, and while it is being held up by the finger, the cervix is to be suddenly carried in an arc of a circle, downward and backward by means of the tenaculum which has been hooked in the anterior lip, and is held in the other hand. When the version has become complete, the fundus can be pressed up against the utero-sacral ligaments by aid of the finger in the vagina. These ligaments, having thus been put slightly on the stretch, gape as the tension is suddenly relaxed

Fig. 50.



Mode of correcting a retroversion with the finger.

by carrying the cervix backward, and the fundus then slips between them. The finger must be quickly passed from the posterior cul-de-sac against the anterior lip, the tenaculum withdrawn, and the organ thrown forward by passing, as shown in Fig. 50, the finger repeatedly down the anterior face of the uterus, so as to press the cervix downward and backward into the hollow of the sacrum.

A glance at the figure will show that the anterior wall of the bladder A—B, when made tense, becomes the fulcrum at A, over which the leverage is exerted. Therefore, when the cervix is pressed downward and backward, the fundus must to the same extent go forward in the direction indicated by the arrow. This manœuvre, however, will be found at first more rational in theory than easy in practice, since it requires some dexterity or sleight of hand to accomplish it.

The uterus is represented in the figure as if it had been drawn forward, and the fundus released from under the promontory of the sacrum. If the organ were left in this position, the cervix would soon settle towards the vaginal outlet, and the fundus into the hollow of the sacrum. It is, therefore, necessary to antevert the uterus immediately, and fit an instrument which will lift it in the pelvis, and at the same time carry the cervix so far backward that the weight of the organ itself will keep the fundus forward. If there were nothing in the pelvis in front of the uterus but the bladder, as represented in the figure, it would be easy to effect this. The intestines, however, are packed about the upper part of the uterus, and have to be displaced before the organ can be made to occupy another position. If we were simply to press the cervix downward and backward by a single effort, the rectum behind, and the intestines above, would be temporarily compressed by the fundus, but they would immediately recover their elasticity when the force was removed, and reproduce the original condition. The sleight of hand consists in keeping up the steady movement of the cervix backward, effecting the manipulation by a number of efforts, instead of a single one, the uterus being allowed to spring back, or slightly recover itself, after each advance. Then the cervix having been, by this means, carried as far back towards the hollow of the sacrum as the length of the finger will permit, the manœuvre must be repeated again and again until at length the fundus will have become turned over on to the bladder.

If an unusual degree of pain is experienced at any point, we must use our judgment as to how far it may be safe to proceed, or desist entirely for the time being, until all acute symptoms shall have subsided under the proper treatment. Even when successful, I frequently make no attempt, by mechanical means, to hold the uterus in position. I wait until I have again replaced it, and have satisfied myself that no tenderness on pressure exists at any point which would come in contact with the pessary to be used.

It is wise to proceed with great care after the reduction of a retroversion of long standing. Whenever I have met with more difficulty than usual, or have caused much pain in treating an office patient, I always have a large hot-water vaginal injection administered immediately, followed by a glycerine dressing in the vagina, and order several hours rest before allowing the patient to return home. When treating patients in my hospital, under the same circumstances, I keep them in bed twenty-four hours, as a precaution. The result is that I now no longer have a dread of exciting cellulitis, which was formerly of frequent occurrence, when less care was taken to guard against it.

CHAPTER XVI.

PESSARIES.

Proper time for their use—Peculiarities to be met—Object of pessaries—Individual forms—Block-tin for modelling—Adjusting pessaries.

This subject is one of the most important and is the least understood.

There is a proper time for using these instruments, just as there is for a splint in adjusting a fracture, and there is also a proper manner of applying them.

Without full appreciation of both of these requirements, the damage inflicted by employing pessaries will be far greater than any chance benefit which may be obtained from them. From some members of the profession, the opposition to the use of pessaries is as denunciatory as if they were condemning a species of malpractice. This opposition may be sincere, but it is conclusive evidence of their ignorance. I have never known a practitioner who was able to fit a pessary properly who was not also fully satisfied with the amount of benefit derived from its use.

The practitioner, to become an expert in fitting a pessary that it may do no harm, must have a decided mechanical talent; and, that the full benefit may be derived from the use of the instrument, he must be able to appreciate slight shades of difference which would be entirely overlooked by others. The first is a gift, which cannot be acquired; the second can be gained by experience, but is of little practical value unless associated with the first. I have known physicians, who, although quite dexterous in moulding the instrument, that it should do no harm, habitually failed in obtaining benefit from it, through want of observation or appreciation of what was to be accomplished in the individual case. Frequently, physicians have written to me with the request that I would send them a pessary for some case then under treatment, without their appreciating the necessity for sending proper measurements, as they would in ordering a hat or any garment through another person. The great cause of failure and disappointment in the use of pessaries lies in the fact that the vagina is expected by many to adapt itself to any instrument which may be introduced, when in fact it is essential that the peculiarities of each individual case should be studied. In adjusting a pessary, the physician should pay as much regard to the peculiarities of shape and size of the vagina as the dentist does to those of the mouth when fitting a set of false teeth. I am fully aware that it will be considered an extravagant statement by many, but, nevertheless, I do not hesitate to make the assertion that scarcely two women can be found who will be benefited by wearing exactly the same shaped instrument. Fortunately, it is true, there are many women who are able to tolerate an ill-fitting instrument without receiving injury, but they are not benefited, except it be by sheer good luck.

Several years ago, I was urged to endorse a pessary, which had some merit, but it had been patented. I refused on this ground, and as a matter of principle, since my self-respect would not allow my name to be associated with anything which was to be advertised. The inventor was so importunate that, to get rid of him, I pointed to a lot of old pessaries and told him, if he could find any two which were exactly of the same size and shape, I would change my mind. I had just had my office refitted, and into a small keg there had been thrown the accumulations of many years, in the shape of pessaries which had been formed from the ordinary block-tin rings. In full confidence, this man, having spread them over the floor, spent several hours looking over between five and six hundred pessaries which had been fitted and worn by as many individuals, but was unable to find what he sought for.

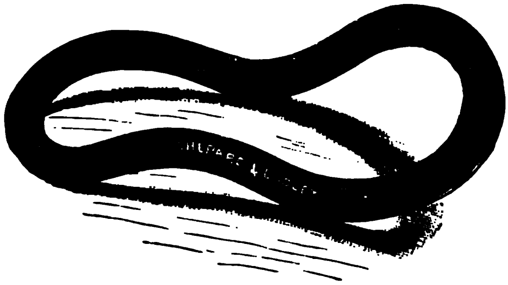
By reference to Chapter VIII., page 125, it will be seen that the necessity has been insisted upon for restoring the uterus to its proper place in the pelvis, where the circulation will be completely established. Unless this be done, it will prove a matter of little consequence how much care may have been bestowed on the shape of a pessary. The common error committed when attempting to correct a prolapse, is to lift the uterus too high in the pelvis; just in proportion as this is done above the health plane, by so much will traction be made on the connective tissue of the pelvis to obstruct the circulation, and with the same effect as if the organ had prolapsed to that degree below the proper line. It has been shown that when the prolapsed uterus is gently lifted from the floor of the pelvis on the extremity of the finger, a point will be reached when the patient will express herself as being relieved of all feeling of fulness and bearing-down. This feeling is to be our guide, and a valuable one it is when the patient is able to appreciate it. It is impossible to teach any one this art of judging of just how high the uterus should be lifted; it can be gained by experience alone, and then only by those who have been gifted by nature with the faculty of observation. When our judgment happens to be confirmed by the feelings of the patient, the result cannot be otherwise than satisfactory. It must be accepted as a rule, that, when the instrument fits properly and has corrected the prolapse, the patient will be unconscious of its presence in the vagina, and shall only realize the fact from the sense of relief afforded while standing or walking. It is scarcely probable that those who object to pessaries will be likely to attribute their past failures to obtain good results with them to some defect within themselves. Yet, they may rest assured that such has been the case invariably, if the failures have occurred when the patient was in a proper condition to wear an instrument.

The Form of Pessaries to be Used.—Far more is dependent on the operator than on the actual form of the pessary. A person possessed of proper skill can effect more by a simple piece of bent wire, or by a pad of cotton, properly placed in the vagina, than another can with the aid of a complete armamentarium. Some modification, however, of Hodge's closed lever pessary, will be found applicable to the largest number of cases, as it conforms more nearly than any other to the natural shape of the vagina. The pessary should be fitted for the vagina without any outside appliance whatever, and to accomplish this is the perfection of the art. In practice we will scarcely ever meet with a case in which this cannot be effected, but it often requires exceptional skill. If there were no other objection to every outside appliance, the fact that the patient has to be manipulating it constantly would be sufficient to condemn it, and there can be no better plan devised for rendering a woman a confirmed invalid. After fitting a pessary, all aid should be given her to forget, as long as possible, that she is wearing a support, and this cannot be done if any portion be outside. Once the instrument has been given the proper shape, it does not require to be removed for months, during which time the uterus is supported steadily, without change, at the same plane in the pelvis, thus facilitating the gradual recovery of tone in the uterine ligaments. But, so long as the instrument has to be removed several times a day, and the position of the uterus is as often changed, no permanent advance will be made towards recovery.

After the conception of Hodge's closed lever pessary, I consider the most important advance was made by Dr. Sims, about 1859, in his recognition of the importance of fitting each pessary to the vagina, and in his suggesting the block-tin rings. These rings are made of an alloy of tin and lead, in such proportions as to be easily moulded, and yet unyielding enough for the pessary to keep its shape when placed in the vagina. I have used these for some eighteen years, and upon every occasion of their use endeavoring to make each instrument individual in its conformation, and I believe that it would be impossible to devise a form of pessary that I have not employed.

Previous to 1868, I took, as a rule, the support for the instrument behind the symphysis, but since that time I have preferred to take it from the bottom of the posterior cul-de-sac. The shape, as given in Fig. 51, or some modification of it, represents the pessary I have generally employed at the Woman's Hospital, and also in private practice, since the date mentioned. After it has been moulded into proper shape, it may thus be used, or it may serve as a model for one to be made of hard rubber, aluminium, or silver (gilded). Some time since, I furnished Dr. Leonard, of the firm of Shepard and Dudley, of New York, six pessaries of different sizes, but of the same general shape, to be made in hard-rubber. He has succeeded so well, that I now depend entirely on those furnished by him, only making such slight alterations as may be needed for any individual case. This is very readily done by means of a gas jet or a spirit lamp, care being taken, before heating the rubber, to smear the surface well with some simple ointment free from water. The grease is necessary to prevent the rubber from taking fire, and it should be free from water, as the steam causes the rubber to break while being bent. The surface to be moulded must be heated gradually, and if any portion should take fire, it must be withdrawn for a second and more grease applied.

Fig. 51.



Modification of Hodge's pessary, in hard rubber.

When the substance becomes soft enough, it can be easily moulded into the desired shape, and held in this form by the fingers until dipped into cold water to harden it. These pessaries, made by the models I have furnished, conform so closely to the general shape of the vagina that when of the proper length, they seldom require to be altered, except as to the width at any point, the curve for the posterior cul-de-sac, or the arc for the neck of the bladder.

Dr. Albert H. Smith, of Philadelphia, has also modified Hodge's closed lever pessary in making it more pointed in front and with a sharper curve for the posterior cul-de-sac than the instrument just described.

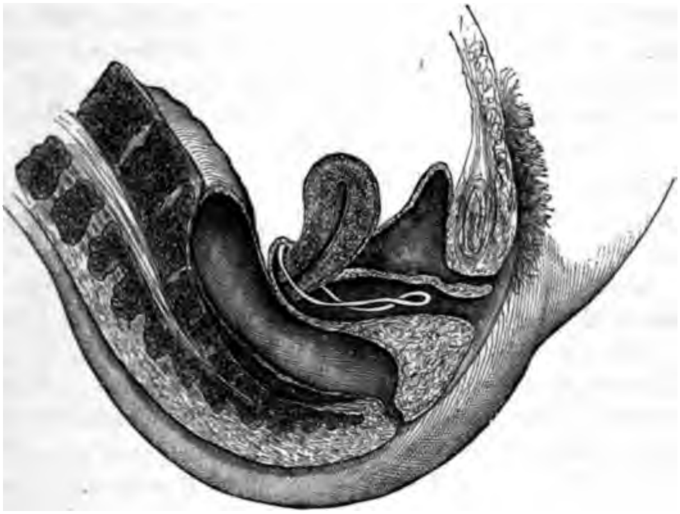
An instrument on the principle of the closed lever pessary, and of the same general shape as those furnished by Shepard and Dudley, will, according to my experience, furnish the most useful form of support. But their full efficiency cannot be secured if the vaginal outlet is too large, or if the posterior cul-de-sac is not of a natural depth. The fulcrum of this double lever rests on the bottom of the cul-de-sac, and in front against the posterior wall of the vagina. The latter support prevents the instrument from slipping forward if there is no prolapse of the vaginal column below from absence of the perineum. The instrument should be curved at one extremity, with reference to the shape of this cul-de-sac and posterior wall, and bent at the other end in the opposite direction with a lesser curve, so that it will be balanced, as it were, in the vagina. But when the patient stands on her feet, the weight of the uterus will be thrown on the short lever forming the long curve in the posterior cul-de-sac. The leverage thus exerted will cause the other end, or long lever, to be elevated, so as to rest against the anterior wall of the vagina, near the neck of the bladder. This action is identically the same as if a weight were applied to the tail-board of a cart heavy enough to elevate the shafts. As the woman assumes the horizontal position, and the weight of the uterus is again removed, the long lever of the instrument will rest in the axis of the vagina. This rocking movement does not, however, change the position of the uterus to any appreciable degree. As the posterior lever becomes depressed from the weight of the uterus above, the instrument will slide forward in consequence of the shape of the cul-de-sac. This will take place just sufficiently along the upward curve of the posterior wall of the vagina, to compensate and prevent the occurrence of any prolapse. Then, as the weight of the uterus is removed, and the long lever of the instrument lies in the axis of the vagina, the posterior curve regains its position at the bottom of the cul-de-sac.

The instrument will thus adjust itself by a change of position, so that it cannot cut into the vaginal tissues from continued pressure at any one point.

Whenever it is possible to avoid making the pubis the chief point of support, it should be done. But it is often unavoidable when the anterior wall of the vagina has become shortened in consequence of a retroversion of long standing, and where prolapse of the posterior wall has been produced from laceration of the perineum. Whenever the vaginal outlet has become so open as to permit the anterior and posterior walls of the vagina to prolapse, a surgical operation, to be described hereafter, will be necessary. Closure of the laceration through the perineum will be required before any properly fitting support can be worn with advantage for correcting the retroversion. But before this can be accomplished some form of pessary will be needed as a temporary means of relief, and the only available point of support will be from behind the symphysis. An instrument fitted under such circumstances must be made wider below, and with the greater curve also at this end, so that any downward pressure may have the effect of crowding the anterior extremity of the pessary well up behind the pubes. This always renders it necessary that a depression should be made in the instrument to protect the neck of the bladder, since the chief support of the pessary must be gained in this neighborhood.

There are certain general laws which are equally applicable to the adjusting of all forms of pessaries. That such an instrument may do no harm, it is necessary for it to be small enough to admit of the passage of the finger between it and the vaginal wall at any point while the patient lies on the back. It must be just large enough to give the needed support to the uterus, and be, at the same time, small enough to permit the vagina to gradually regain its natural size. The elasticity of the vaginal wall is sufficient to admit of a dilatation to the extent of the pelvic excavation, but it will be an exception to the rule when a pessary properly curved need ever be over three inches in length and about an inch and a half in width. To obtain the proper length for the pessary, my rule is, while the patient lies on the back, to pass the whalebone stick, or any straight blunt instrument, along the index finger into the posterior cul-de-sac, and measure from behind the pubes. I place the index finger behind the symphysis pubis, and then withdraw both it and the stick together, and take the ascertained measurement, less the thickness of the finger, as a guide for the length of the instrument. Thus measured, the instrument will be found of just the proper length, if the woman be examined while standing. After determining this important point, the next step will be to give the proper curve to that portion of the instrument which is to rest in the posterior cul-de-sac. When retroversion has existed, a longer curve will be needed in the cul-de-sac than when the instrument is required only to lift the organ from the floor of the pelvis to relieve a prolapse, after enlargement of the uterus. With the latter condition, the upper portion of the vagina will be somewhat pear-shaped, or more dilated than below, and it will be necessary to make the instrument conform to this peculiarity. When a pessary is thus made larger above, so that the vaginal walls can close about it below, the effect is to crowd it upwards into the canal. An instrument should never be so abruptly curved, in the posterior cul-de-sac, as to make direct pressure against the uterus at its junction with the vagina, but at some little distance beyond it. The circulation in the neck and lower portion of the body is easily obstructed by pressure at this point. The consequence is, that engorgement of the uterus is soon produced, and, in the effort of nature to relieve it, a discharge takes place, which will form an erosion about the os, to be mistaken, in all probability, for and treated as ulceration. Even a more serious consequence arises if there be an urgent necessity for wearing a pessary. For, from direct pressure, a state of irritation or inflammation of the lymphatic glands found in this neighborhood frequently becomes established, with an intolerance to the presence of any instrument in the posterior cul-de-sac. Should the anterior wall of the vagina be short, and the curve of the pessary be such as to rest just at the junction of the vagina and uterus, the instrument must necessarily form a fulcrum, over which the organ will soon become retroverted. For those cases in which there is thickening of the posterior wall and retroversion, it is absolutely necessary that the curve of the instrument be such that it will pass as far as possible beyond the uterus into the cul-de-sac. This is necessary, not only that it may not furnish a fulcrum to reproduce the displacement, but also that the instrument may not cause irritation by touching the posterior wall of the uterus, which, in such cases, is always sensitive on pressure. As a rule, we cannot change a retroversion except by lifting the organ bodily up in the pelvis with a pessary so curved as to go far beyond into the cul-de-sac. The uterus must then, in time, become anteverted and the flexure will be overcome. When the uterus is thus suspended, as shown in Fig. 52, from the curve of a pessary which extends too far above to admit of the recurrence of the retroversion, the organ must be crowded over forward. With the uterus in this position, the weight of the viscera above will force the fundus forward in the direction of the least resistance. This has the effect of keeping the cervix pressed against the posterior wall of the vagina, and will, in time, be likely to change the flexure into a simple version.

Fig. 52.



Pessary applied for retroversion.

The extremity of the pessary which goes into the cul-de-sac should be rounded gradually, and not made too narrow in proportion to its length, unless there should be some special reason for doing so. The utero-sacral ligaments become sometimes inflamed, from the irritation established by a badly fitting pessary, and a condition results which it is difficult to relieve. These ligaments are, as we have seen, on each side of the uterus, just above the vaginal junction, and extending to the sacrum, form partially the sides of Douglas's cul-de-sac. Frequently inflammation is produced by injudicious distribution of pressure from a pessary so curved as to rest against the uterus just at its junction with the vagina. The same result frequently follows the use of a pessary of which the upper end has been made somewhat square, having two corners which, by imbedding into the tissues, localize the pressure too much, and produce irritation; also by forcing the ligaments as far apart as their near attachment to the uterus will permit. The well-defined and thickened edges of these ligaments are often found to be exceedingly sensitive to pressure, as the finger is passed into the posterior cul-de-sac. Should this condition be overlooked, and a pessary be introduced without some proper preparatory treatment, an attack of pelvic cellulitis will most likely result. To remove this sensitiveness, it is necessary to use the hot-water vaginal injections, to apply iodine freely to the surface of the cul-de-sac every third or fourth day, and to endeavor to gain some support for the uterus. This condition of the ligaments may be kept up for an indefinite length of time, if there be no restraint placed on the movements of the patient. While on her feet, the weight of the uterus and viscera above is sustained chiefly by these ligaments, and more especially so, if they have become shortened by previous inflammation. It is, therefore, necessary for a limited time, that the patient should remain chiefly in the recumbent position, when this can be done without detriment to the general health. If necessary, as a temporary expedient to allow of the patient's exercising, the needed support can generally be supplied by a cotton pessary, in the shape of a half-grown mushroom, placed in front of the cervix. This is made by taking a square pledget of damp cotton, pressing it between the hands, and folding the corners over towards the centre, until a ball has been formed of the proper size. Then as the corners are held between the extremities of four fingers, the stem portion is formed by wrapping a cord about the cotton between the ends of the fingers and the ball portion. When well formed, saturated with glycerine, and properly placed, this will make a useful support for simple prolapse.

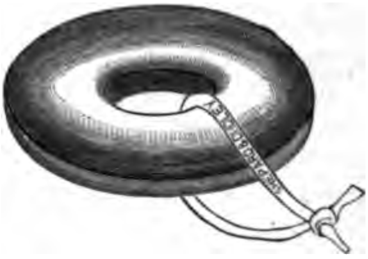
If the patient lies on the back, with her limbs flexed, and has the perineum depressed by two fingers of the operator, it will be an easy matter, by the aid of a pair of forceps, to introduce this cotton pessary; and if it is of a proper size and so placed as to avoid making pressure on any sensitive point, it will give great comfort and support for hours.

When there is no posterior cul-de-sac, or when this portion of the vagina is unusually small a retroversion is always found; as the space is too limited for the cervix, this is necessarily pushed forward in the axis of the vagina, and the effect is to throw the fundus into the hollow of the sacrum. This class of cases we find among young girls or sterile women, and it is a condition exceedingly difficult to correct until more room is gained for the cervix to lie in the cul-de-sac. This space can be gained and the retroversion reduced only by a perfectly straight or flat pessary, fitted to receive its support from behind the symphysis. Then it will be requisite for the instrument to put the vagina sufficiently on the stretch to carry the neck of the uterus so far into the hollow of the sacrum as to produce an anteversion. On account of the peculiar form of the instrument, and of the small size of the vagina in these cases, great care should be exercised in fitting the pessary, and watchfulness afterwards, that it may not cut into the tissues; particularly in fitting it about the pubes. There is occasionally a difference in the curve on the two sides of the symphysis, so that, if a pessary is made symmetrical, it may press against and cut into the soft parts covering the lesser curve. If the vagina is small, there should be no salient angles but gradual curves at the anterior end of the pessary, and it is often necessary to bend the corners downward, to corespond with the roof of the vagina at this point. A depression for the urethra should also always be made.

The shorter the vagina (that is, from deficiency of the cul-de-sac) the straighter must the instrument be; for, if curved too much, it will rotate and remain across the axis of the canal. A straight instrument should be wider in the middle, in proportion to its length, than a curved one. The widest part of the vagina is from one sulcus to the other; the lateral walls and posterior surface of the canal form a concavity. Consequently, a curved instrument should be made smaller in the middle, as its support is chiefly derived from the posterior wall of the vagina. It is a very common occurrence to find a pessary, when too wide, cutting its way along the lateral walls of the vagina, at the bottom of a deep fold which it forms as it is carried downward from the pressure above.

For the purpose of illustrating the use of the cotton pessary, it was described somewhat out of place, but with it should be classed the hollow India-rubber disk. This disk, of the shape given in Fig. 53, but a little larger, is made of thin rubber and inflated. There are certain conditions in which this form of support will be found most useful, and, whenever the glycerine is not particularly called for, the disk will answer the purpose better for continued use than the cotton pessary. It is chiefly useful for the treatment of cases, when, in consequence of a previous attack of cellulitis, there still remains too much tenderness on pressure for the use of an ordinary pessary. To avoid making pressure on the urethra, or any other point, a depression can be made at any part of the disk

Fig. 53.



Rubber disk pessary.

by passing a small elastic band once or twice around it. The instrument may be placed in front of or behind the uterus, according to circumstances. It answers for anteversion when placed in front of the cervix, provided no tenderness exists on the anterior wall; for retroversion it may be introduced behind, in the posterior cul-de-sac if this is large enough, and if there has been no cellulitis in the neighborhood. I have used it chiefly where cellulitis has existed in one of the broad ligaments, and when the inflammation has subsided sufficiently to render it safe for the patient to commence outdoor exercise. The use of the disk, in these cases, will prevent the uterus from sagging in the pelvis while the patient stands, and will thus protect the shortened broad ligament from traction. It may be so placed in the axis of the vagina, that the depression made by the elastic band shall correspond to the thickened ligament which had been inflamed and prevent all pressure upon it, or it may be introduced across the vagina, in front of the cervix, as may be indicated by the capacity of the vagina and the amount of thickening. To facilitate its introduction, it is only necessary to compress the disk between the fingers after it has been lubricated with a little soap and water. Grease should not be employed, as it destroys the elasticity of the disk and rots the material. The offensive discharge from the vagina produced by the long use of soft rubber is a serious objection to it. If it remains in the vagina for any length of time, it often causes pruritis, and even vaginitis. Any instrument made from this material should, therefore, be only for temporary use, or until a better substitute can be found. The irritating effects of the rubber can be guarded against, if the patient will take the trouble to remove the instrument at night and whenever it is not needed to aid her in exercising. As soon as it has been removed, it should be carefully cleansed in cold water, and wiped dry. A loop of cord passed through the centre of the instrument will greatly facilitate its removal. By degrees, the air will escape, and the instrument will become partially collapsed, but it can be again easily inflated by means of a hypodermic syringe. A thickened portion can be readily felt in the side of the disk, through which the air was introduced in the first instance. As the syringe will have to be refilled several times with air, it must be detached from the needle, since if many punctures be made it will again soon collapse. While the syringe is detached, the finger should be placed over the opening in the needle to prevent the escape of the air already introduced.

Under no circumstance should a piece of sponge be introduced into the vagina as a substitute for a pessary. Of all substances which are employed for the purpose this becomes the most offensive. But the most serious objections to its use is its dilating quality, which may cause it in time to expand the vagina to the full size of the pelvic excavation; and it ceases to give the needed support unless the size is increased from time to time; moreover its continued use destroys all the natural support and elasticity of the tissues, so much so, that, when full dilatation of the canal has taken place, no effective instrumental appliance can any longer be made; and should it be necessary to resort to surgical procedure to relieve the procidentia—a condition of frequent occurrence—it will be difficult to obtain satisfactory union. I have frequently learned, on inquiry, that the use of the sponge has been recommended by physicians "who have no faith in pessaries," and, I may add, by those who are unable to fit them.

CHAPTER XVII.

ETIOLOGY OF UTERINE FLEXURES.

Tables (XXIV. to XXX.) showing the relations of flexures, general and special, to marriage, celibacy, pregnancies, miscarriage, menstruation, etc. etc.—Anteflexures—Retroflexures—Lateral flexures.

It is difficult to account for the diversity of views entertained by prominent medical men regarding the origin and treatment of flexures except upon the supposition that the cause and effect of these troubles are often confounded. Let us see, therefore, if we cannot arrive at some definite knowledge on the subject, but to do this we must go back to the beginning of menstrual life, and study the initial stages of, and the subsequent changes in, the different forms of flexures. We may thus be able to analyze symptoms, to separate the cause of one flexure from another, and to appreciate that their origin varies, and that the treatment must vary with the form. For this purpose there will be presented the data obtained from the records of three hundred and forty-five cases which have passed under observation in my private hospital.

We shall consider first, flexures of the cervix, at, or below, the vaginal junction; and, secondly, those of the uterine body, forward, backward, and lateral, the last being, in all probability, but deviations from the other two forms of flexure of the body. Table XXIV. shows that one hundred and eighty-two women were found with flexure of the cervix, of which sixty-two were unmarried, one hundred and thirteen sterile, and seven were doubtful as to previous pregnancy. There were ninety-one flexures of the uterine body forward, consisting of fourteen unmarried, forty-two sterile, and thirty-five fruitful so far as to have been impregnated. Seven unmarried, nine sterile, and thirteen fruitful women suffered from retroflexion, in all twenty-nine. Forty-three were found with lateral flexures, of which number six were unmarried, twenty-five sterile, and twelve had been impregnated.

52.75 per cent. of all the flexures were of the cervix, and 47.24 per cent. of the body; 26.37 per cent. of the whole number were of the body forward, 8.40 per cent. backward, and 12.45 lateral. The proportion of unmarried was 69.66 per cent. for flexures of the cervix, and 30.33 per cent. for flexures of the body. For the sterile, 59.78 per cent. were of the cervix, and 40.21 per cent. of the body. For the fruitful, 10.44 per cent. were flexures of the cervix, and 89.55 per cent. of the body. Thus of all women with flexures, 25.80 per cent. were unmarried, 54.76 per cent. were sterile, and 19.43 per cent. were fruitful. The proportion for the total number of all flexures was 14.09 per cent. of all the cases of every description under observation.

TABLE XXIV.—*Flexures of the Uterus.*

	Flexures of the uterine body.								Total flexures of the body.	Flexures of the cervix.		Total body and cervix.
	Forward.	Percentage.	Backward.	Percentage.	To the right.	Percentage.	To the left.	Percentage.		Number.	Percentage.	
Unmarried	14	15.61	7	7.88	4	4.49	2	2.24	27	62	69.66	89
Percentage	15.38	51.85	24.13	25.92	28.57	14.81	6.89	7.40	16.56	34.06	...	25.80
Sterile	42	22.22	9	4.76	8	4.12	17	8.99	76	113	59.78	189
Percentage	46.15	55.26	31.03	11.84	57.14	10.52	58.62	22.36	46.62	62.18	...	54.76
Fruitful	35	51.79	13	19.40	2	2.98	10	14.92	60	7	10.44	67
Percentage	38.46	58.33	44.82	21.66	14.28	3.33	34.08	16.66	36.81	3.84	...	19.43
Total	91	26.37	29	8.40	14	4.05	29	8.40	163	182	...	345
Percentage	55.82	...	17.77	...	8.50	...	17.77	...	47.25	52.75		

By reference to Table III., page 155, will be seen the relative and actual proportion of the unmarried, sterile, and fruitful. The unmarried with flexures were 8.01 per cent., and the sterile 27.36 per cent. in excess of the average, while for the fruitful the liability to flexure is 35.95 per cent. less than the general liability. It is thus evident that the woman who has been impregnated is rarely found with a flexure of the cervix, and in comparison with other women is but little liable to flexures of the uterine body.

The proportion of flexures of the cervix was for the unmarried 34.06 per cent., for the sterile it was 62.18 per cent., and for the fruitful only 3.84 per cent. Now, as to the total number of the married women with this condition of the cervix 94.16 per cent. were sterile. My convictions are that the proportion is even greater, since I have never observed a marked case of flexure of the cervix in any woman who had gone to full term. In a total of 182 cases we find only seven women with this form of flexure who were supposed to have been impregnated. After carefully going over the records of these cases, it was found that in five instances the occurrence of a

Table XXV.—*Flexures of Uterus, with Reference to Age at First Menstruation.*

	Age at first menstruation	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	Flexure of the cervix.	Flexures of the uterine body.					Total number of flexures of the cervix.	Total number of all flexures.	Average age at puberty.	Average age at marriage.
													Forward.	Backward.	To the right.	To the left.	Total.				
Unmarried.	Flexures of the cervix	2	2	4	15	17	12	5	4	1	....	62	....	....	....	....	....	62	....	14.01	
	Of the body. Forward	....	....	3	3	4	2	1	1	....	....	....	14	....	....	....	....	....	....	13.85	
	Backward	....	....	1	3	....	1	1	1	....	....	....	....	7	....	....	....	....	....	14.14	
	To the right ...	....	....	....	2	....	2	....	....	....	....	....	....	....	4	....	....	....	....	14.00	
	To the left. ...	....	....	....	1	1	....	....	....	....	....	....	....	....	....	2	....	....	....	13.50	
	Total	2	2	8	24	22	17	7	6	1	....	....	....	....	....	....	27	62	89		
	Percentage	2.24	2.24	8.98	26.96	24.75	19.10	7.97	6.73	1.12	....	....	15.38	9.87	4.39	2.19	31.47	68.53	16.56	13.98	
Sterile.	Flexures of the cervix	....	2	19	24	30	15	12	7	1	3	113	....	....	....	....	....	113	....	14.09	21.32
	Of the body. Forward	....	....	3	11	6	10	7	3	2	....	....	42	....	....	....	....	....	....	14.51	22.25
	Backward	....	....	1	3	4	....	....	....	1	....	....	....	9	....	....	....	....	....	13.80	23.11
	To the right ...	....	....	1	3	1	1	2	....	....	....	....	....	....	8	....	....	....	....	14.00	23.50
	To the left	....	1	1	2	7	3	3	....	....	....	....	....	....	....	17	....	....	....	14.11	17.11
	Total	....	3	25	43	48	29	24	10	4	3	....	....	....	....	....	76	113	189		
	Percentage	....	1.58	13.22	22.75	25.39	15.34	12.69	5.23	2.11	1.58	....	22.46	3.74	4.27	9.09	40.21	59.78	46.62	14.19	21.90

TABLE XXV.—*Continued.*

Fruitful.	To full term with no miscarriages.	Of the body.	Forward	....	....	1	4	5	2	1	3	....	....	....	16	....	....	....	....	....	....	14.43	20.35
			Backward	1	....	1	....	1	2	2	....	1	....	....	....	8	....	....	....	....	....	14.50	19.40
			To the right	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	12.00	18.00
			To the left	....	....	....	1	1	1	....	....	....	....	....	....	....	....	3	....	....	....	14.00	24.00
			Total	1	....	3	5	7	5	3	3	1	....	....	....	....	....	....	28	....	28		
			Percentage	3.56	....	10.71	17.85	15.00	17.85	10.71	10.71	3.56	....	....	57.14	28.57	3.57	10.71	100.	....	....	14.32	21.21
	To full term and miscarriages.	Of the body.	Forward	....	....	1	2	....	1	3	....	....	....	....	7	....	....	....	....	....	....	14.42	19.47
			Backward	....	....	1	....	....	1	1	....	....	....	....	....	3	....	....	....	....	....	14.33	26.00
			To the right	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
			To the left	....	....	1	....	5	....	....	....	....	....	....	....	....	....	6	....	....	....	13.66	20.33
			Total	....	....	3	2	5	2	4	....	....	....	....	....	....	....	....	16	....	16		
			Percentage	....	....	18.74	12.50	31.25	12.50	25.00	....	....	....	....	43.75	18.75	....	37.50	100.	....	....	14.12	21.62
	Only miscarriages.		Flexures of the cervix	1	....	1	....	2	2	....	1	....	....	7	....	....	....	....	....	7	....	13.85	19.42
		Of the body.	Forward	....	2	1	5	3	1	....	....	....	....	....	12	....	....	....	....	....	....	13.00	21.50
			Backward	....	....	....	....	2	....	....	....	....	....	....	....	2	....	....	....	....	....	14.00	19.00
			To the right	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	10.00	21.00
			To the left	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	14.00	20.50
			Total	2	2	2	5	8	3	....	1	....	....	....	....	....	....	....	16	7	23		
			Percentage	8.69	8.69	8.69	21.73	34.76	13.04	....	4.34	....	....	....	52.17	8.69	4.34	4.34	69.56	30.43	....	13.26	21.47
			Total	3	2	8	12	20	10	7	4	1	....	....	35	13	2	10	60	7	67		
			Percentage	4.47	2.98	11.94	17.91	29.85	14.93	10.44	5.97	1.48	....	....	....	....	....	....	....	....	36.80	13.91	22.31
Summary.			Total No. of all conditions, for each year	5	7	41	79	90	56	38	20	6	3	182	91	29	14	29	163	....	345		
			Percentage	1.02	1.58	10.12	21.13	25.93	17.28	12.51	6.99	2.22	1.17	....	....	....	....	....	....	....	....	14.08	22.01

age of puberty has any bearing on the form of flexures, or of their existence at that time. The average age, however, both for those with flexure of the cervix, and those with flexure of the uterine body is a little earlier than that already given for the general average age of puberty; but this may be accidental. The delay in development for the sterile woman is about as much above the general average as the age of puberty for the unmarried and fruitful woman was below it. The only marked difference from the average age for those with flexures under all social conditions, is found among the women who had always miscarried, and had never gone to full term. The number is small, it is true, being only seven cases of flexure of the cervix, who were supposed to have miscarried, and sixteen with different flexures of the body. The average for those with flexure of the cervix was 13.85 years, and for those of the body 13 years, and for the total number 13.26 years. Now, the average age of first menstruation for 120 women, who had suffered from various diseases, but had never gone to full term, and only miscarried, was 13.38 years; an age far earlier than the general average for all women of which these formed a part. As the difference is decided in both instances, and even so great as one year for those with flexures of the body who had miscarried, the circumstance can scarcely be a mere coincidence.

Different degrees of regularity are found to exist with different flexures of the body, but the averages for those with flexure of the cervix are essentially the same as those taken upon all women under observation, and given in Table III., page 155. A comparison made between Table III., containing the general averages, Table XVI., containing those for anteversions, and the accompanying Table XXVI., for those who suffered from different forms of flexures, will present many points of interest for the student. By comparison, it is evident, so far as can be judged by the test of the woman's regularity, that flexures are formed, as a rule, in after life. This is particularly striking in regard to retroflexions; for the proportion of women who were found in after life with this form of flexure, and were regular from the first, is much larger than is shown to have been the case for all women under observation. The proportion of those who were regular after a certain time, as well as those who were never regular, are also more favorable than those given in Table III., on the general average. A study of these tables will also point out a closer parallelism between versions and flexures; particularly is it well marked between retroversion and retroflexion.

TABLE XXVI.—*Condition of Menstruation with Flexures.*

	Condition of menstruation.	Unmarried.	Sterile.	Fruitful.
Flexures of the cervix.	Regular from the first	34	75	1
	Percentage	64.15	77.33	50.00
	Regular afterwards	12	10	1
	Percentage	22.64	10.20	50.00
	Never regular	7	12	....
	Percentage	13.20	12.37	....
	Total	53	97	2
	Percentage	34.86	63.82	1.31
Anteflexures.	Regular from the first	6	27	25
	Percentage	42.85	69.23	78.12
	Regular afterwards	6	9	4
	Percentage	42.85	23.07	12.50
	Never regular	2	3	3
	Percentage	14.29	7.69	9.37
	Total	14	39	32
	Percentage	16.47	45.88	37.64
Retroflexures.	Regular from the first	5	7	12
	Percentage	83.33	77.77	92.30
	Regular afterwards	....	2	1
	Percentage	....	22.22	7.69
	Never regular	1	....	....
	Percentage	16.66	....	....
	Total	6	9	13
	Percentage	21.42	32.14	46.43
Lateral flexures.	Regular from the first	4	14	4
	Percentage	100.00	77.77	57.14
	Regular afterwards	....	2	1
	Percentage	....	11.11	14.28
	Never regular	....	2	2
	Percentage	....	11.11	28.57
	Total	4	18	7
	Percentage	13.79	62.07	24.13

The want of regularity seems to have been some bar to fruitfu
The number of sterile women, and of those who had been impreg

having flexures of the uterine body, were about equal. The number observed, however, may be considered too small for any practical deductions to be drawn from them. But, I find, that of the total number of all women under observation, 197 cases, or 9.00 per cent., had never been regular; of these, 38.57 per cent. had been impregnated, and 35.53 per cent. were sterile. Although the number of each class who were never regular is practically the same, yet, as there were in the total number of women under observation more than twice as many fruitful as sterile, the proportion of sterile is in excess.

The condition of menstruation as to regularity seems to have but little connection with the amount of pain experienced.

It has already been shown by Table VII., page 159, that of 2178 cases at puberty, 13.63 per cent. had pain for a short time, at the beginning of the flow; 13.49 per cent. suffered pain during the flow; while 72.90 per cent. were free from pain. Of that number 22.61 per cent. of sterile women, and 8.52 per cent. of fruitful women had pain at the beginning of the flow. Of those who suffered pain during the flow, 25.29 per cent. were sterile, and 4.79 per cent. were fruitful women, while but 52.09 per cent. of sterile women were free from pain, in contrast to 86.67 per cent. of those who, in after life, proved fruitful. Painful menstruation is thus not only an indication of sterility, but, we shall see hereafter, it also points out the form of flexures. In Table XXVII. is given the condition of menstruation, as noted in 152 cases of flexure of the cervix. The unmarried and sterile constitute each about 50 per cent., and there were two women who were supposed to have miscarried. Of the total number of these flexures, 59.86 per cent. suffered pain at the beginning of the flow, 9.86 per cent. during the flow, while 30.26 per cent. were free from pain. Again, it will be seen that 49.05 per cent. of the unmarried, and 65.97 per cent. of the sterile had pain in the beginning of the flow; 7.45 per cent. of the unmarried, and 11.34 per cent. of the sterile suffered during the flow; while 43.39 per cent. of the unmarried, and 22.68 per cent. of the sterile were free from pain. Thus, we see that with flexures of the cervix pain in the beginning of the flow is the rule, and during the flow the exception. For the absence of pain, in a certain number of cases, we shall hereafter offer an explanation in another connection.

It will be noted that more than half the number of married women with anteflexures were sterile, a circumstance already referred to and confirmed by the figures given in this table. With this form of flexure 4.70 per cent. had suffered from pain at the beginning of the flow,

TABLE XXVII.—*Showing the Condition of Menstruation as to Regularity and Pain in all forms of Flexure.*

Under "fruitful" are included also all who had aborted or miscarried.	MENSTRUATION REGULAR FROM THE FIRST.								MENSTRUATION REGULAR AFTERWARDS.								MENSTRUATION NEVER REGULAR.								SUMMARY.						
	Unmarried.		Sterile.		Fruitful.		Total.		Unmarried.		Sterile.		Fruitful.		Total.		Unmarried.		Sterile.		Fruitful.		Total.		Unmarried.		Sterile.		Fruitful.		Total.
	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	
Flexures of the cervix.																															
With pain at the beginning of the flow	17	24.28	53	75.71	...		70	...	7	58.33	4	33.53	1	8.33	12	...	2	22.22	7	77.77	...	...	9	...	76	28.57	64	70.33	1	1.09	91
Percentage	50.00	...	70.66	...	...		63.63	...	58.33	...	40.00	...	100.	...	52.17	...	28.33	...	58.33	...	...	...	47.36	...	49.05	...	65.77	...	50.00	...	59.86
With pain during the flow..............	4	36.36	7	63.33	...		11	...	...	...	2	100.	...	...	2	...	...	...	2	100.	...	...	2	...	4	26.66	11	73.33	1	...	15
Percentage	11.76	...	9.33	...	...		10.00	...	...	...	20.00	...	...	...	8.69	...	...	...	16.66	...	...	...	10.52	...	7.54	...	11.34	...	50.00	...	9.86
Free from pain	13	44.82	15	51.72	1	3.44	29	...	5	55.55	4	44.44	...	...	9	...	5	62.50	3	37.50	...	...	8	...	23	50.00	22	49.27	...	...	46
Percentage	38.23	...	20.00	...	100.		26.36	...	41.66	...	40.00	...	...	...	39.13	...	71.42	...	25.00	...	...	...	42.10	...	43.39	...	22.68	...	...	...	30.26
Total	34	[illegible]	75	68.18	1	.90	110	...	12	52.17	10	43.47	1	4.34	23	...	7	36.84	12	63.15	...	...	19	...	53	34.86	97	63.81	2	1.31	152
Percentage	...	...	...	...	...	...	...	72.36	...	...	...	...	...	...	...	15.13	...	...	...	...	...	...	...	12.50							
Anteflexion.																															
With pain at the beginning of the flow	...	...	...	...	2	100.	2	...	...	...	...	...	1	100.	1	...	...	...	1	100.	...	...	1	...	...	...	1	25.00	3	75.00	4
Percentage	...	...	...	...	8.00	...	3.44	...	...	...	...	...	25.00	...	5.26	...	...	...	33.33	...	...	...	12.50	...	...	...	25.64	...	9.37	...	4.70
With pain during the flow..............	6	20.68	17	58.62	6	20.69	29	...	6	54.54	4	36.36	1	9.09	11	...	2	50.00	1	25.00	1	25.00	4	...	14	31.81	22	50.00	8	18.18	44
Percentage	100.	...	62.96	...	24.00	...	50.00	...	100.	...	44.41	...	25.00	...	57.89	...	100.	...	33.33	...	33.33	...	50.00	...	100.	...	58.97	...	25.00	...	51.76
Free from pain.......	...	...	10	37.03	17	62.96	27	...	...	...	5	71.42	2	28.57	7	...	...	...	1	33.33	2	66.66	3	...	...	...	16	43.30	21	56.75	37
Percentage	...	...	37.03	...	68.00	...	46.55	...	...	...	55.55	...	50.00	...	36.84	...	...	...	33.33	...	66.66	...	37.50	...	...	...	41.02	...	65.62	...	43.52
Total	6	10.34	27	46.55	25	[illegible]	58	...	6	31.57	9	47.36	4	21.05	19	...	2	25.00	3	37.50	3	37.50	8	...	14	16.47	39	46.31	32	[illegible]	85
Percentage	...	...	...	...	...	...	...	68.23	...	...	...	...	...	...	...	22.35	...	...	...	...	...	...	...	9.41							

Table XXVII.—*Continued.*

Retroflexures.	With pain at the beginning of the flow	...	...	1	50.00	1	50.00	2	...	...	...	1	100.	...	...	1	...	1	100.	...	...	...	...	1	...	1	25.00	2	50.00	1	25.00	4
	Percentage	...	...	14.28	...	8.33	...	8.33	...	...	...	100.	...	...	...	33.33	...	100.	...	...	...	...	...	100.	...	16.66	...	22.22	...	7.69	...	14.26
	With pain during the flow	2	40.00	3	60.00	...	...	5	...	...	...	...	...	1	100.	1	...	...	...	...	...	...	...	...	...	2	33.33	3	50.00	1	16.66	6
	Percentage	40.00	...	42.85	...	...	...	20.83	...	...	...	...	...	100.	...	33.33	...	...	...	...	...	...	...	...	...	33.33	...	33.33	...	7.69	...	21.42
	Free from pain	3	17.64	3	17.64	11	64.70	17	...	...	...	1	100.	...	...	1	...	...	...	...	...	...	...	...	...	3	16.66	4	22.22	11	61.11	18
	Percentage	60.00	...	42.85	...	91.66	...	70.83	...	...	...	100.	...	...	...	33.33	...	...	...	...	...	...	...	...	...	50.50	...	44.44	...	84.60	...	64.28
	Total	5	20.83	7	29.16	12	50.00	24	...	...	...	2	66.66	1	33.33	3	...	1	100.	...	...	...	...	1	...	6	21.42	9	32.14	13	46.42	28
	Percentage	...	...	...	...	...	...	...	35.07	...	...	...	...	...	...	...	10.71	...	...	...	...	...	...	...	3.57	...	...	...	...	...	...	
Lateral flexures.	With pain at the beginning of the flow	1		5	71.42	1	14.28	7	...	...	...	...	...	...	...	...	...	...	...	2	100.	...	...	2	...	1	11.11	7	77.77	1	11.11	9
	Percentage	25.00	14.28 ...	35.71	...	25.00	...	31.81	...	...	...	...	...	...	...	...	...	...	...	100.	...	...	...	50.00	...	25.00	...	38.88	...	14.27	...	31.03
	With pain during the flow	2	28.57	5	71.42	...	...	7	...	...	...	1	100.	...	...	1	...	...	...	...	...	...	...	...	...	2	25.00	6	75.00	...	...	8
	Percentage	50.00	...	35.11	...	...	...	31.81	...	...	...	50.00	...	...	...	33.33	...	...	...	...	...	...	...	...	...	50.00	...	33.33	...	...	...	27.58
	Free from pain	1	12.50	4	50.00	3	37.50	8	...	...	...	1	50.00	1	50.00	2	...	...	...	...	...	2	100.	2	...	1	8.33	5	41.66	6	50.00	12
	Percentage	25.00	...	28.57	...	75.00	...	36.36	...	...	...	50.00	...	100.	...	66.66	...	...	...	...	...	100.	...	50.00	...	25.00	...	27.77	...	85.71	...	41.37
	Total	4	18.18	14	63.63	4	18.18	22	...	...	...	2	66.66	1	33.33	3	...	...	...	2	50.00	2	50.00	4	...	4	13.79	18	62.06	7	24.13	29
	Percentage	...	...	...	...	...	...	...	78.86	...	...	...	...	...	...	...	10.34	...	...	...	...	...	...	...	13.79	...	...	...	...	...		

51.76 per cent. during the flow, and 43.52 per cent. were free from pain. The number, however, who suffered from pain at the beginning is too small for the proportion to be accepted, without further observation, since it consisted of but one sterile and three fruitful women. These cases, it may be assumed, began menstrual life with flexures of the cervix, and the body of the uterus became involved afterwards. This table shows that all the unmarried, and the greater portion of the sterile, as well as of the fruitful women, suffered pain during the flow, which would indicate that this is the rule, while pain, at the beginning of the flow, is the exception, in anteflexures of the body.

The number of retroflexions is comparatively small, but the proportion is greatest among fruitful women; and absence from pain at the first menstrual period was the rule.

The greater proportion of those who suffered from lateral flexures were sterile, and over half the number had pain in after life, either in the beginning of or during the flow. But, of the total number, a larger percentage had been free from pain at the beginning of menstrual life than was shown to have been the case with either the unmarried, sterile, or fruitful women separately.

Table XXVIII. gives the average length of the menstrual flow, at puberty and in after life, for all conditions of uterine flexures. The average length of menstruation at puberty was 4.76 days in all cases of flexure of the cervix. But little variation existed in the average time between the unmarried and sterile. As there were but two women who were supposed to have been impregnated, all the comparisons made will be between the two other social conditions. The average length of flow was 4.80 days with those who were regular from the beginning; with those who were never regular, 4.33 days; while for those who became regular afterwards it varied but little from that found for the whole number. When there was pain, the flow was prolonged to 4.89 days, as compared with the 4.18 days for those who had no pain.

The average length of the menstrual flow in after life, for all cases of flexure of the cervix, was 4.62 days. The time became shortened with both the unmarried and sterile women, but more markedly so with the former.

The duration of flow, at the beginning of menstrual life, averaged 4.90 days for the total number of those who suffered from anteflexure, and there was but the slightest variation from this average for either social condition. Those who were regular from the first menstruated 4.97 days, and when regular afterwards, 5 days. As in flexures of

TABLE XXVII.—*Continued.*

Retroflexures.	With pain at the beginning of the flow	...	...	1	50.00	1	50.00	2	...	...	...	1	100.	...	...	1	...	1	100.	...	...	...	...	1	...	1	25.00	2	50.00	1	25.00	4
	Percentage	...	...	14.28	...	8.33	...	8.33	...	...	...	100.	...	...	...	33.33	...	100.	...	...	...	...	...	100.	...	16.66	...	22.22	...	7.69	...	14.26
	With pain during the flow..................	2	40.00	3	60.00	...	...	5	...	...	...	...	...	1	100.	1	...	...	...	...	...	...	...	...	...	2	33.33	3	50.00	1	16.66	6
	Percentage	40.00	...	42.85	...	...	...	20.83	...	...	...	...	...	100.	...	33.33	...	...	...	...	...	...	...	...	...	33.33	...	33.33	...	7.69	...	21.42
	Free from pain........	3	17.64	3	17.64	11	64.70	17	...	...	...	1	100.	...	...	1	...	...	...	...	..	...	..	...	...	3	16.66	4	22.22	11	61.11	18
	Percentage	60.00	...	42.85	...	91.66	...	70.83	...	...	...	100.	...	...	...	33.33	...	...	...	...	...	...	...	...	...	50.50	...	44.44	...	84.60	...	64.28
	Total..................	5	20.83	7	29.16	12	50.00	24	...	...	...	2	66.66	1	33.33	3	...	1	100.	...	...	...	...	1	...	6	21.42	9	32.14	13	46.42	28
	Percentage	...	...	...	...	...	...	...	35.07	...	...	...	...	...	...	...	10.71	...	...	...	...	...	...	...	3.57	...	...	...	...	...	...	
Lateral flexures.	With pain at the beginning of the flow	1		5	71.42	1	14.28	7	...	...	...	...	...	...	...	...	...	...	...	2	100.	...	...	2	...	1	11.11	7	77.77	1	11.11	9
	Percentage	25.00	14.28 ...	35.71	...	25.00	...	31.81	...	...	...	...	...	...	...	...	...	...	...	100.	...	...	...	50.00	...	25.00	...	38.88	...	14.27	...	31.03
	With pain during the flow..................	2	28.57	5	71.42	...	...	7	...	...	...	1	100.	...	...	1	...	...	...	...	...	...	...	...	...	2	25.00	6	75.00	...	...	8
	Percentage	50.00	...	35.11	...	...	...	31.81	...	...	...	50.00	...	...	...	33.33	...	...	...	...	...	...	...	...	...	50.00	...	33.33	...	...	...	27.58
	Free from pain........	1	12.50	4	50.00	3	37.50	8	...	...	...	1	50.00	1	50.00	2	...	...	...	...	...	2	100.	2	...	1	8.33	5	41.66	6	50.00	12
	Percentage	25.00	...	28.57	...	75.00	...	36.36	...	...	...	50.00	...	100.	...	66.66	...	...	...	...	...	100.	...	50.00	...	25.00	...	27.77	...	85.71	...	41.37
	Total..	4	18.18	14	63.63	4	18.18	22	...	...	...	2	66.66	1	33.33	3	...	...	...	2	50.00	2	50.00	4	...	4	13.79	18	62.06	7	24.13	29
	Percentage	...	...	...	...	...	...	...	78.86	...	...	...	...	...	...	...	10.34	...	...	...	...	...	...	...	13.79	...	...	...	...	...		

TABLE XXVIII.—*Condition of Menstruation as to Regularity, Pain, and Length of Flow, at Puberty and in After-life.*

			Regular from the first.					Regular afterwards.					Never Regular.					Summary.				
			Unmarried.	Sterile.	Fruitful.	Total number.	General average.	Unmarried.	Sterile.	Fruitful.	Total number.	General average.	Unmarried.	Sterile.	Fruitful.	Total number.	General average.	Unmarried.	Sterile.	Fruitful.	Total number.	Av. length of flow.
Flexures of the cervix.	With pain at the beginning of the flow..		17	53	...	70	...	7	4	1	12	...	2	7	....	9	....	26	64	1	91	
	Average length of menstruation at	Puberty	5.28	4.73	...	...	4.94	4.50	5.66	4.50	...	4.88	2.00	5.50	....	....	4.33	4.94	4.87	4.50	....	4.89
		Afterwards	4.47	4.77	...	...	4.70	5.42	4.50	5.00	...	5.08	2.50	4 57	....	....	4.11	4.57	4.73	5.00	....	4.69
	With pain during the flow..............		4	7	...	11	...	...	2	...	2	...	....	2	....	2	....	4	11	....	15	
	Average length of menstruation at	Puberty	4.92	4.53	...	...	4.82	...	4.60	...	...	4.60	....	3.00	....	....	3.00	4.92	4.45	....	....	4.54
		Afterwards	5.50	5.00	...	...	5.18	...	5.50	...	...	5.50	....	2.50	....	....	2.50	5.50	5.54	....	....	4.20
	Free from pain..........................		13	15	1	29	...	5	4	...	9	...	5	3	....	8	....	23	22	1	46	
	Average length of menstruation at	Puberty	3.00	4.50	...	...	4.12	...	4.33	...	...	4.33	....	....	....	....	....	3.00	4.44	....	....	4.18
		Afterwards	2.50	4.80	4.00	...	4.41	3 40	4.00	...	...	3.66	5.40	5.00	....	....	5.25	5.17	4.68	5.00	....	4.41
	Total number of flexures of the cervix..		34	75	1	110	...	12	10	1	23	...	7	12	....	19	....	53	97	2	152	
	Average length of menstruation at	Puberty	4.36	4.60	...	...	4.80	...	...	...	...	4.75	....	....	....	....	4 33	4.76	4.78	4.50	....	4.76
		Afterwards	4.41	4.80	4.00	...	4.67	4.58	4.50	5.00	...	4.56	4.57	4.33	....	....	4.42	4.47	4.71	4.50	....	4.62
Anteflexures of the body.	With pain at the beginning of the flow		...	...	2	2	...	...	...	1	1	...	....	1	....	1	....	....	1	3	4	
	Average length of menstruation at	Puberty	4.92	4.83	4.00	...	4.00	5.50	5.80	5.50	...	5.50	5.25	2.00	....	....	2.00	5.00	4.89	4.33	....	4.89
		Afterwards	...	...	5.50	...	5.50	...	...	3.00	...	3.00	....	1.00	....	....	1.00	....	1.00	4.66	....	3.75
	With pain during the flow..............		6	17	6	29	...	6	4	1	11	...	2	1	1	4	....	14	22	8	44	
	Average length of menstruation at	Puberty	6.00	5.06	4.50	...	5.20	4.66	4.00	7.00	...	4.88	4.00	4.66	3.00	....	4.11	5.16	4.91	4.75	....	4.97
		Afterwards	4.16	4.88	4.16	...	4.51	5.00	3.50	4.00	...	4.36	5.00	3.00	3.00	....	4.00	4.61	4.09	4.00	....	4.06
	Free from pain..........................		...	10	17	27	...	...	5	2	7	...	....	1	2	3	....	....	16	21	37	
	Average length of menstruation at	Puberty	4.36	5.21	5.00	...	4.97	5.00	4.57	5.00	...	4.75	6.50	3.40	4.00	....	4.25	4.75	4.75	4.93	....	4.86
		Afterwards	...	4.80	5.05	...	4.96	...	5.00	4.00	...	4.71	....	3.00	6.00	....	5.00	....	4.75	5.00	....	4.91
	Total number of anteflexures		6	27	25	58	...	6	9	4	19	...	2	3	3	8	....	14	39	32	83	
	Average length of menstruation at	Puberty	4.93	5.02	4.86	...	4.97	4.71	4.94	5.50	...	5.00	5.11	4.35	3.50	....	4.30	4.95	4.81	4.83	....	4.90
		Afterwards	4.16	4.86	4.88	...	4.79	5.00	4.33	3.75	...	4.42	5.00	2.33	5.00	....	4.00	4.64	4.53	4.73	....	4.63

TABLE XXVIII.—*Continued.*

Retroflexures of the body.	With pain at the beginning of the flow		...	1	1	2	...		1	...		...	1	....	....	1	....	1	2	1	4	
	Average length of	Puberty	...	6.00	7.00	...	6.33		...	...		...	2.00	....	....	....	2.00	2.00	6.00	7.00	....	5.25
	menstruation at	Afterwards	...	7.00	5.00	...	6.00		1.00	...		1.00	5.00	....	....	....	5.00	5.00	4.00	5.00	....	4.50
	With pain during the flow		2	3	..	5			...	1		...	....	....	....	....	....	2	3	1	6	
	Average length of	Puberty	4.50	4.40	...	...	4.50		...	5.00		5.00	....	....	....	....	....	4.50	4.40	7.00	....	5.33
	menstruation at	Afterwards	3.00	3.33	...	...	3.20		...	7.00		7.00	....	....	....	....	....	3.00	3.33	7.00	....	3.83
	Free from pain		3	3	11	17	...		1	...		...	....	....	....	....	....	3	4	11	18	
	Average length of	Puberty	3.66	5.33	5.45	...	5.03		4.00	4.00		4.00	....	....	....	....	....	3.66	5.14	5.33	....	4.90
	menstruation at	Afterwards	3.00	6.00	5.18	...	4.91		5.00	...		5.00	....	....	....	....	....	3.00	5.75	5.18	....	4.94
	Total number of retroflexures		5	7	12	21	...	...	2	1	3	...	1	....	....	1	....	6	9	13	28	
	Average length of	Puberty	3.87	5.50	5.52	...	5.12	...	4.00	5.00	..	4.75	2.00	....	....	....	2.00	3.66	5.33	5.50	....	5.02
	menstruation at	Afterwards	3.00	5.00	5.16	...	4.66	...	3.00	7.00	...	4.33	5.00	....	....	....	5.00	3.33	4.63	5.30	....	4.64
Lateral flexures of the body.	With pain at the beginning of the flow			5	1	7	...	...	...	...	...	...	....	2	....	2	....	1	7	1	9	
	Average length of	Puberty	.00	3.66	7.00	...	5.00	...	...	...	...	...	2.00	....	....	....	2.00	7.00	3.66	7.00	....	5.00
	menstruation at	Afterwards	.00	4.20	6.00	...	4.85	...	...	...	...	...	....	3.50	....	....	3.50	7.00	4.00	6.00	....	4.55
	With pain during the flow			5	...	7	...	...	1	...	1	...	....	....	....	....	....	2	6	....	8	
	Average length of	Puberty	6.00	4.50	...	...	5.23	...	...	...	...	...	2.00	....	....	....	2.00	4.66	4.50	....	....	4.60
	menstruation at	Afterwards	5.00	5.20	...	...	5.14	...	3.00	...	...	3.00	....	....	....	....	....	5.00	4.83	....	....	4.87
	Free from pain			4	3	8	...	...	1	1	2	...	....	....	2	2	....	1	5	6	12	
	Average length of	Puberty	5.25	3.75	5.00	...	4.75	...	5.50	2.00	...	4.33	....	....	....	....	....	5.25	4.33	4.25	....	4.57
	menstruation at	Afterwards	10.00	5.00	4.00	...	5.25	...	4.00	3.00	...	3.50	....	....	7.50	....	7.50	10.00	4.50	5.00	....	5.33
	Total number of lateral flexures		4	14	4	22	...	...	2	1	3	...	....	2	2	4	....	4	18	7	29	
	Average length of	Puberty	5.71	3.88	5.50	...	4.86	...	5.50	2.00	...	4.33	2.00	....	....	....	3.08	4.59	5.00	4.60	....	4.58
	menstruation at	Afterwards	6.75	4.78	4.50	...	5.09	...	3.50	3.00	...	3.33	....	3.50	7.50	....	6.50	6.73	4.50	5.14	....	4.96

essentially the same for flexures of the cervix as for those of the body, either forward or backward.

The average length at puberty, on all cases of lateral flexures, was 4.58 days, and was essentially the same for the unmarried, sterile, and fruitful women. In after life the flow for the unmarried was increased to 6.75 days; for the sterile it became lessened, and again increased with the fruitful women.

If the general averages as given in Table X. page 166, under the head of menstruation, be accepted as standards, it will be seen, that under all conditions, both at puberty and in after life, the length of menstruation is much less for those who have flexures of the cervix. As a rule, the contrary is the case for flexures of the uterine body, for the averages at puberty are much higher than the general ones, but in after life the difference is not so great.

In this connection the fact must not be forgotten that the duration of the menstrual flow is always lessened in proportion to the amount of pain suffered. This has its bearing, in indicating the existence of flexures of the cervix at the time of puberty, and, if accepted, it is of equal importance to prove that those of the body are formed in after life. The changes in menstruation after puberty, when flexures have existed, are presented in Table XXIX. These are treated of under two heads, as regards the length of flow. In the first two divisions are grouped those in whom no change in the length of the period occurred, although the quantity became altered in those of the second. The duration became shorter for those forming the third, and lengthened for those in the fourth division; while in both sections the quantity has undergone some change. Menstruation remained unchanged in every respect, from what it was at the beginning, in 47.37 per cent. of all cases with flexure of the cervix. Thus there were forty cases where the flow was normal as to quantity, with an average of 5.04 days' duration. Twelve cases were always too free, as they had been from the beginning, but the time remained unchanged, and lasted 6.41 days; while with sixteen other cases the flow was always scanty, lasting but 3.12 days. In this group of cases, where no change took place in after life, the average length of normal menstruation for the unmarried was 4.40 days, and for the sterile, 4.85 days. Again, with 44 cases, or 23.94 per cent., forming the second group, the time remained the same as at the beginning, but the quantity became either increased, lessened, or irregular in after life. The average duration of flow for this class, it will be seen, was 4.23 days.

We find this result, that of the whole number of flexures of the cervix, 76.18 per cent., consisting of the first and second groups, remained in after life the same as to the length of menstruation, but with a certain number of cases the quantity became changed. The third group, consisting of 17 cases, or 11.11 per cent. of the whole, was formed of those with whom the duration of the period became lengthened, while the quantity either increased or lessened. The average duration of the whole group in after life was 6.23 days. The fourth group consists of 19 cases, or 12.50 per cent. of the whole, in which the time became shorter in after life, and the quantity was also changed. The average length of the period was 3.26 days for this group.

It is shown by Table XXIX. that with only 11 cases of anteversion, or 12.94 per cent., forming the first group, the menstrual flow remained unchanged in after life. But if the second group be included with the first, it will be found that with 51 cases, or 60 per cent., the length of flow remained unchanged after puberty. Table XXX., as a summary of Table XXIX., demonstrates that the changes in quantity are more marked with anteflexion than with any other form of flexure. It is shown that with nearly one-half of all the cases of anteflexion the period becomes lessened. This proportion would be even greater at a later period of life, since the rule is that the flow is at first increased in quantity but afterwards becomes less. A further consideration of these tables would present but little additional interest to the general reader, but the student will find many suggestive points, for the elucidation of which additional observations might be profitably undertaken.

The time of marriage seems to have had but little bearing on either class of flexures, or, at least, none where there existed flexure of the cervix. The chief point of note is the fact that the average age of marriage was a little later than the general one. Either extreme of age, however, may have had an indirect bearing. For instance, the average age of marriage among the sterile women with lateral flexures, was 19.20 years, and for those women who had been impregnated it was 25.75 years. Among those who had been sterile, there were seventeen flexures to the left, and the average age of marriage, as shown in Table XXV., page 330, for these women was 17.11 years. This is the lowest average of any one class, yet a high one, since several women were somewhat advanced in life on the one hand, and on the other, the greater number were much below the average given, one having been married at fourteen years of age. In eight of these cases evidences of previous cellulitis were detected, a condition very

TABLE XXIX.—*Showing the Length and Changes of Menstruation in after-life, with Flexures of the Uterus.*

			LENGTH AND QUANTITY OF FLOW REMAINED UNCHANGED, BEING FROM THE BEGINNING								LENGTH OF FLOW REMAINED UNCHANGED, BUT THE QUANTITY BECAME AFTERWARDS EITHER								LENGTH OF FLOW INCREASED, WITH THE QUANTITY EITHER								LENGTH OF FLOW LESSENED, WITH THE QUANTITY EITHER								SUMMARY.	
			Normal.		Too free.		Scanty.		Total.		Increased.		Lessened.		Irregular.		Total.		Increased.		Lessened.		Irregular.		Total.		Lessened.		Increased.		Irregular.		Total.			
			No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.
Flexures of the cervix.	Single.	No. of cases....	15	..	4	..	3	..	22	..	3	..	11	..	1	..	15	..	5	..	1	..	...	..	6	..	10	..	...	..	...	..	10	..	53	
		Average length of menstruation	...	5.40	...	7.00	...	2.00	...	5.22	...	5.06	...	3.36	...	5.00	...	3.93	...	6.20	...	5.00	...	..	...	..	...	2.70	...	..	...	..	...	2.70	..	4.47
		Percentage ..	34.09	..	33.33	..	18.75	..	...	..	23.07	..	42.30	..	20.00	..	...	..	31.35	..	100.	..	...	..	...	..	55.55	..	...	..	...	..	...	..		
	Sterile.	No. of cases....	28	..	8	..	13	..	49	..	10	..	15	..	4	..	29	..	11	..	...	..	...	..	11	..	7	..	...	..	1	..	8	..	97	
		Average length of menstruation	...	4.85	...	6.12	...	3.38	...	4.67	...	4.30	...	4.66	...	3.50	...	4.37	...	6.33	...	..	...	..	...	6.33	...	3.85	...	..	...	4.00	...	3.87	..	4.71
		Percentage ..	63.83	..	66.66	..	81.35	..	...	..	76.02	..	57.69	..	80.00	..	...	..	68.75	..	...	..	...	..	...	..	38.88	..	...	..	100.	..	...	..		
	Fruitful.	No. of cases....	1	..	...	..	...	..	1	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	1	..	...	..	...	..	1	..	2	
		Average length of menstruation	..	5.00	...	..	...	..	...	5.00	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	4.00	...	..	...	..	...	4.00	..	4.50
		Percentage ..	2.27	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	5.55	..	...	..	...	..	...	..		
		Total	41	5.04	12	6.41	16	3.12	72	4.84	13	4.61	26	4.11	5	3.80	44	4.23	16	6.31	1	5.00	...	..	17	6.23	18	3.22	...	..	1	4.00	19	3.26	152	4.62
		Percentage ..	61.11	..	16.66	..	22.22	..	47.37	..	29.54	..	59.09	..	11.36	..	28.94	..	94.11	..	5.88	..	...	..	11.11	..	94.73	..	...	..	5.26	..	12.50	..	..	

TABLE XXIX.—*Continued.*

Anteflexures.	*Unmar.*	No. of cases....	3	..	1	..	...	..	4	..	2	..	5	..	1	..	8	..	...	..	...	..	...	..	...	..	2	..	...	..	...	..	2	..	14	
		Average length of menstruation	...	6.00	...	5.00	...	..	...	5.75	...	4.00	...	5.00	...	5.00	...	4.75	...	..	...	..	...	..	...	..	...	2.00	...	..	...	..	...	2.00	..	4.64
		Percentage ..	37.50	..	50.00	..	...	..	...	..	14.28	..	21.73	..	33.33	..	...	..	...	..	...	..	...	..	...	..	12.50	..	...	..	...	..	...	..		
	Sterile.	No. of cases....	...	..	...	..	...	..	...	..	7	..	11	..	1	..	10	..	6	..	1	..	2	..	9	..	9	..	1	..	1	..	11	..	39	
		Average length of menstruation	...	..	...	..	...	..	...	..	...	5.28	...	5.00	...	3.00	..	5.00	...	5.33	...	7.00	...	4.00	...	5.22	...	3.00	...	4.00	...	4.00	...	3.18	..	4.53
		Percentage ..	...	..	...	..	...	..	...	..	50.00	..	47.82	..	33.33	..	...	..	66.66	..	33.33	..	100.	..	...	..	8.25	..	100.	..	...	..	...	..		
	Fruitful.	No. of cases....	5	..	1	..	1	..	7	..	5	..	7	..	1	..	13	..	3	..	2	..	...	..	5	..	5	..	...	..	2	..	7	..	32	
		Average length of menstruation	...	4.60	...	4.00	...	3.00	...	4.28	...	4.60	...	3.57	...	3.00	...	3.92	...	5.66	...	7.00	...	..	...	8.00	...	3.80	...	..	...	6.00	...	4.42	..	4.75
		Percentage ..	67.30	..	50.00	..	100.	..	...	..	35.71	..	30.43	..	33.33	..	...	..	33.33	..	66.66	..	...	..	...	..	31.25	..	...	..	...	..	...	..		
		Total	8	5.12	2	4.50	1	3.00	11	4.81	14	4.85	23	4.37	3	3.66	40	4.48	9	6.44	3	7.00	2	4.00	14	6.21	16	3.12	1	4.00	3	8.00	20	3.50	85	4.63
		Percentage ..	72.72	..	18.17	..	9.09	..	12.94	..	35.00	..	57.50	..	7.50	..	47.05	..	64.28	..	21.42	..	14.28	..	16.47	..	80.00	..	5.00	..	15.00	..	23.53	..	..	
Retroflexures.	Unmar.	No. of cases....	2	..	1	..	...	..	3	..	1	..	2	..	...	..	3	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	6	
		Average length of menstruation	...	3.00	...	5.0	...	..	...	3.66	...	4.00	...	2.50	...	..	...	3.00	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	..	3.33
		Percentage ..	25.00	..	100.	..	...	..	...	..	20.00	..	40.00	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..	...	..		
	Sterile.	No. of cases....	2	..	...	..	...	..	2	..	...	..	2	..	...	..	2	..	1	..	...	..	...	..	...	..	4	..	...	..	...	..	4	..	9	
		Average length of menstruation	...	6.00	...	..	...	..	...	6.00	...	..	...	6.00	...	..	...	6.00	...	9.00	...	..	...	..	...	..	...	2.00	...	..	...	..	...	2.00	..	4.55
		Percentage ..	25.00	..	...	..	...	..	...	..	...	..	40.00	..	...	..	...	..	100.	..	...	..	...	..	...	..	80.00	..	...	..	...	..	...	..		
	Fruitful.	No. of cases....	4	..	...	..	1	..	5	..	4	..	1	..	1	..	6	..	...	..	...	..	...	..	...	..	1	..	1	..	...	..	2	..	13	
		Average length of menstruation	...	4.75	...	..	...	5.00	...	4.80	...	5.75	...	5.00	...	4.00	...	5.33	...	..	...	..	...	..	...	..	...	7.00	...	6.00	...	..	...	6.50	..	5.30
		Percentage ..	50.00	..	...	..	100.	..	...	..	80.00	..	20.00	..	100.	..	...	..	...	..	...	..	...	..	...	..	20.00	..	100.	..	...	..	...	..		
		Total	8	4.62	1	5.00	1	5.00	10	4.70	5	5.40	5	4.40	1	4.00	11	4.81	1	9.00	...	..	...	..	1	9	5	3.00	1	6.00	...	..	6	3.50	28	4.64
		Percentage ..	80.00	..	10.00	..	10.00	..	35.70	..	45.45	..	45.45	..	9.09	..	39.28	..	100.	..	...	..	...	..	3.57	..	83.33	..	16.66	..	...	..	21.42	..	..	
Lateral flexures.		Unmarried.....	1	5.00	1	7.00	...	..	2	..	1	5.00	...	..	...	..	...	..	1	10.	...	..	...	..	...	..	...	..	...	..	...	..	...	..	4	6.75
		Sterile	7	5.00	...	..	4	2.50	11	..	1	5.00	1	5.00	...	..	...	..	2	7.50	...	..	...	..	...	..	3	3.33	...	..	...	..	...	..	18	4.50
		Fruitful.........	...	..	1	10.	2	4.00	3	..	2	5.50	1	4.00	...	..	...	..	...	..	...	..	...	..	...	..	1	3.00	...	..	...	..	...	..	7	5.50
		Total	8	5.00	2	8.50	6	3.16	16	4.12	4	5.25	2	4.50	...	..	6	5.00	3	8.33	...	..	...	..	3	8.33	4	3.25	...	..	...	..	4	3.25	29	4.96

TABLE XXX.—*The Condition of Menstruation at Puberty, and after Changes in Duration and Quantity, in Flexures of the Uterus.*

		Period unchanged as to time and quantity, being from the beginning			Length of period unchanged, but the quantity became either			Menstruation remaining unchanged in time.			Length of period increased, with the quantity either			Length of period lessened, with the quantity either			Menstruation changed in both time and quantity.			Summary.		
		Normal.	Too free.	Scanty.	Increased.	Lessened.	Irregular.	Number of cases.	Average length of period.	Per cent. for each condition.	Increased.	Lessened.	Irregular.	Lessened.	Increased.	Irregular.	Number of cases.	Average length of period.	Per cent. for each condition.	Total number of cases.	Average length of period on all conditions.	Per cent. for each condition.
Of the cervix.	Normal	41	....	....	....	...	....	41	5.01	37.03	....	....	....	....	....	....	....	....	....	44	5.04	28.94
	Scanty	....	....	16	....	....	....	16	3.12	13.79	....	....	....	....	....	....	....	....	....	16	3.12	10.52
	Too free or increased	....	12	....	13	....	....	25	5.48	21.55	16	....	....	....	....	....	16	6.31	41.44	41	5.80	26.97
	Lessened	....	....	....	....	23	....	23	4.11	22.41	...	1	....	18	....	1	19	3.31	52.77	45	3.72	29.60
	Irregular	....	....	....	....	....	5	5	3.80	4.31	....	....	....	....	....	....	1	4.00	2.77	6	3.83	3.94
	Total	....	....	....	....	....	....	116	4.61	....	....	....	....	....	....	....	36	4.66	....	152	4.62	
	Percentage on each condition	28.04	7.89	10.52	8.55	17.10	3.28	....	....	....	10.52	.65	....	11.84	....	.65						
Anteflexures.	Normal	8	....	....	....	....	....	8	5.12	15.68	....	....	....	....	....	....	....	....	....	8	5.12	9.41
	Scanty	....	....	1	....	....	....	1	3.00	1.96	....	....	....	....	....	....	....	....	....	1	3.00	1.17
	Too free or increased	....	2	....	11	....	....	16	4.81	31.37	9	....	....	....	1	....	10	6.20	20.41	26	5.34	30.58
	Lessened	....	....	....	....	23	....	23	5.58	45.00	....	3	....	16	....	....	19	3.73	55.88	42	4.19	49.41
	Irregular	....	....	....	....	....	3	3	3.66	5.88	....	....	2	....	....	3	5	4.80	14.70	8	4.37	9.41
	Total	....	....	....	....	....	....	51	4.64	....	....	....	....	....	....	....	34	4.61	....	85	4.63	
	Percentage on each condition	9.41	2.35	1.17	16.45	27.05	2.52	....	....	....	10.37	3.52	2.35	18.82	1.17	3.52						
Retroflexures.	Normal	8	....	....	....	....	....	8	4.62	38.09	....	....	....	....	....	....	....	....	....	8	4.62	28.57
	Scanty	....	....	1	....	....	....	1	5.00	4.76	....	...	....	....	....	....	....	....	....	1	5.00	3.57
	Too free or increased	....	1	....	5	....	....	6	5.33	28.57	1	....	....	....	1	....	2	7.50	28.57	8	5.87	28.57
	Lessened	....	....	....	....	5	....	5	4.44	23.80	....	....	....	5	....	....	5	3.00	71.42	10	3.70	35.71
	Irregular	....	....	....	....	....	1	1	4.00	4.76	..	....	....	....	....	....	....	....	....	1	4.00	3.57
	Total	....	....	....	....	....	....	21	4.70	....	....	....	....	....	....	....	7	4.28	....	28	4.64	
	Percentage on each condition	28.57	3.57	3.57	17.85	17.85	3.57	....	....	....	3.57	....	....	17.85	3.57							
	Normal	8	...	....	....	....	....	8	5.00	36.36	....	....	....	....	....	....	....	....	....	8	5.00	27.58
	Scanty	....	....	6	....	....	....	6	3.16	27.27	....	....	....	....	....	....	....	....	....	6	3.16	20.68
	Too free or increased	....	2	....	4	....	....	6	6.33	27.27	3	....	....	....	....	....	3	8.33	42.85	9	7.00	31.03

equently found with lateral flexures. The highest average age of arriage for any particular class was found in those who had gone to ll term, generally but once, and had had miscarriage frequently terwards. Seven of these had anteversions; three, retroflexions; d six, lateral flexures to the left. The average age of marriage for ese cases was 28.43 years, and this comparatively advanced age as doubtless an exciting cause of miscarriage and its consequences.

The average age at time of the first examination, for all cases of exure of the cervix, was 24.80. For the unmarried it was 23.42 ears; for the sterile, 25.02 years. The duration of the sterility as 3.21 years. There were but two cases of supposed pregnancy n which miscarriage had taken place, at an average of 8.50 years, revious to the first examination.

The average age of those with flexures of the body forward was 27.94 years. The unmarried averaged 23.97 years; the sterile, 28.78 years, and the fruitful, 31.28 years. The average length of time ince marriage was, for the sterile, 7.61 years; and since the last pregnancy, for those who had borne children, it was 7.63 years; for those who had only miscarried, 6.20 years; in two cases, due to criminal abortion, four years had elapsed.

The age of those suffering from retroflexion averaged 30.68 years; of the unmarried 29.22 years; of the sterile 24.25 years; and of the fruitful 34 years. The average length of time since marriage was 8.44 years in the sterile; since the last impregnation, for those who had gone to full term, 7.46 years; for those who had miscarried 5.83 years; and after one case of criminal abortion it was five years.

The average age of first examination, for the total number with lateral flexure, was 31.37 years; that for the unmarried being 33.50 years; for the sterile 30 years; and for the fruitful 31.40 years. The time since marriage, for the sterile, was 6.86 years; one woman had gone to full term and remained sterile 13 years. In those who had miscarried 5.66 years, on an average, had elapsed, and in one ase of criminal abortion, the woman had not been again impregnated uring five years.

With all flexures of the body the average age at the time of first amination was 25.88 years for the unmarried; for the sterile, 3.57 years; and for the fruitful, 32.35 years.

It is a remarkable fact, that the average age at which relief was ught should bear a direct proportion to the frequency of the form of xure. This would indicate, if no other proof existed, that flexure the cervix was a condition of puberty and early life, since relief is sought at the earliest age; that anteflexures follow soon after, while retroflexures and the lateral ones, being less common and found in about the same proportion, are developed in later life.

As forming a part of the history of flexures it will be of interest to record the supposed causes of disease as given by the patients themselves. In 22 sterile women, with flexure of the cervix, who had commenced their menstrual life free from pain, five cases are recorded as having suffered sooner or later after marriage, from dysmenorrhœa during the flow. The same result followed in one case from exposure to cold, in another instance from the use of a sewing machine, and one of the fruitful had been well until the time of her supposed miscarriage. Among the unmarried, 23 cases had been free from pain at the beginning, and attributed their dysmenorrhœa in after life, in two instances, to the effects of cold; in two to over-study while at a boarding-school; and another considered it the result of a fall.

All of these cases, when first seen, had, in addition to the flexure of the cervix, hypertrophy, and more or less disease of the body, with some degree of flexure also above the vaginal junction. This would leave thirty-three cases, or over two-thirds, who were free from pain in after life, too small a number to be of great statistical value, but it will serve as an indication of the fact that a certain proportion of flexures of the cervix are unattended by dysmenorrhœa during after life unless other diseases be superadded.

Of eighty-five patients who suffered from anteflexures, sixty-four attributed the origin or aggravation of their dysmenorrhœa to the following causes: eighteen sterile women suffered after marriage from venereal excess, and eight from the effects of cold. Twenty-four fruitful women, the total number of those who had been free from pain, or at least had suffered only at the beginning of the flow, suffered from the following causes: five from natural labor, two from tedious ones, and one from instrumental delivery; twelve had miscarried, two were the victims of criminal abortion, two were worse after falls, and one from fright. Seven unmarried women took cold and suppressed the menstrual flow, three were taken sick from over-study at boarding-school, three suffered from falls, and one from dancing at the time of the period.

Had it been possible to have obtained the facts, I am satisfied that the unknown causes of anteflexure among the sterile and a portion of the fruitful women might have been found in the means taken to prevent conception in early married life by the sterile, and by those who had already borne children; some, doubtless, were the result of ıpregnation. Five were sick after childbirth, seven after misge, and one after the production of a criminal abortion. An of cellulitis followed childbirth in three cases, and in each ce after the miscarriage and abortion. One unmarried woman ıken sick at boarding-school, another from exposure to cold, and ases suffered after falls. Thus the supposed causes of retron in all but three cases have been given. Three sterile women lateral flexures became sick immediately after marriage; one ıl woman after childbirth, three after miscarriages, and one after ıinal abortion. One unmarried woman suffered from exposure l.

xures of the cervix have their origin about puberty, or shortly 'ards, by the balance being lost between the relative growth of ıdy and cervix. From the earliest development of the uterus, ale, until pregnancy, some degree of anteversion exists. With terus in this position, the neck cannot be developed to its full without forcing the cervix forward in the axis of the vagina, direction offering the least resistance. As the body of the lies forward, the cervix must become bent upon itself at or he vaginal junction, and thus the flexure is formed. This must lace, as has already been stated in a previous chapter, or the will become retroverted, the result being determined by the s or absence of the posterior cul-de-sac of the vagina. When rvix is small enough in diameter to be readily bent upon itself, worse at the appearance of the flow and then ceases, or, at any rate, becomes much less. If the degree of flexure is slight, there may be an absence of pain, with as little feeling of discomfort as any female may experience at such a time, or the pain may not come on until after the flow has become fully established. When pain occurs in early menstrual life, and lasts through the flow, with or without a flexure of the cervix, a condition of the circulation already exists in the body of the uterus which later is likely to give trouble and to result in anteflexure.

From the congestion attending menstruation, the flaccid and elongated cervix becomes thickened and shortened, so that the uterine canal is then made nearly straight, with the cervix strong enough to resist the pressure of the posterior wall of the vagina. Therefore, the dysmenorrhœa existing just at the beginning is relieved, and, if the flexure be not very marked, impregnation frequently takes place shortly after marriage. But the chances of impregnation are lessened rapidly after the first year of married life, since disease of the uterine body and ovarian irritation are likely, in time, to be established as Nature's protest against the childless condition of the married female.

There is no other condition where menstruation, being painful at the beginning, is relieved so promptly when the flow becomes established. This symptom may be regarded as characteristic of a simple uncomplicated flexure of the cervix. It has been shown that 8.52 per cent. of twelve hundred and thirty-one fruitful women suffered in early life from pain at the beginning of the flow. This percentage may be assumed as the one in which impregnation is likely to have taken place with flexures of the cervix. We have no other means of arriving at any conclusion on this point, since a flexure of the cervix, in my experience, is never found after a female has gone to full term. I have observed hypertrophy and anteflexure of the uterine body to come on in after life, from some exciting cause, when the flexure of the cervix would gradually disappear as this later condition became established. This new morbid state completed, the sterility would continue, since there was then a greater bar to impregnation than previously. In some cases, when the disease of the body did not become quite so extensive, a degree of flexure would still remain in the cervix. Menstruation, in this condition, would then not only be painful before the flow came on, but would continue so throughout, and, if a sufficient amount of ovarian disturbance had been set up, the pain would be even more severe after the flow had ceased.

If we are able to draw any deduction from the analytical history of anteflexures which has been furnished, it is unequivocally to the effect that this condition has its origin after puberty, and observation indicates it to be the result of obstructed circulation from impaired nutrition. Painful menstruation during the flow may occur under other conditions, but it is never absent in any form of flexure of the uterine body, either forward, backward, or lateral. Whenever a female has been free from pain during menstruation in early life, and anteflexion has been discovered afterwards, it is my firm conviction that in such a case the uterus was in a normal condition at puberty. Where pain has occurred at this early period in the beginning of the flow, becoming intensified with its progress, and lasting until it has ceased, a flexure of the body has not existed necessarily, but a condition which engendered the flexure afterwards. With pain at this period of life, just at the commencement of the flow, and relieved when fully established, a condition exists which has been already explained.

Retroflexions are, I believe, deviations from a previously existing retroversion. While they are always aggravated by an obstructed circulation, as in the case of other flexures of the uterine body, the exciting cause is generally inflammatory action, not in the organ itself but in the connective tissue of the pelvis and ligaments of the uterus.

After a moment's consideration, it will be evident that the uterus may be retroverted to a point at which the broad ligaments, being already on the stretch, may, by inflammation, become shortened so as to produce the flexure. This action may be also aided, once shortening of the broad ligament exists, by inflammation in the utero-sacral ligaments. When a point in the version has been reached, at which the anterior wall of the vagina can no longer yield to the upward pressure of the cervix, any contraction of these ligaments will increase the degree of retroflexion. Since inflammation of the neighboring cellular tissue of the pelvis is, I believe, almost always, if not invariably, an accompaniment of retroflexion, these ligaments become necessarily more or less involved.

Before dismissing the subject of retroflexion, I must express the conviction that this lesion is by no means so commonly found as is generally supposed by the profession. Thickening on the posterior wall of the uterus from obstructed circulation in a case of retroversion is frequently mistaken for it. This condition is not necessarily accompanied by cellulitis, and disappears rapidly after the uterus has been placed in a position where the circulation can again be properly carried on.

CHAPTER XVIII.

TREATMENT OF FLEXURES OF THE UTERUS.

Errors in pathology—Intra-uterine stem pessaries—Dilatation—Curved tents—Division of cervix.

IT must be evident, from what has already been stated in regard to the supposed causes of flexures, that no course of treatment can be adopted which would be universally applicable.

The sole cause of confusion which has existed hitherto in regard to the proper treatment originated in the error of attempting to treat he common symptom or result as the disease. The condition in ommon was the flexure, under which head have been placed effects roduced by very different causes.

It has been clearly shown that not only must a wide distinction be rawn between a flexure of the cervix and one of the uterine body, ut also between the different forms of the latter. In one condition, has been shown, the exciting cause is a want of proper development, th a result which takes place mechanically, and produces, as a rule, disturbance, except at the beginning of the menstrual period. The er condition, a flexure of the uterine body, is a result brought ut by obstruction to the circulation, its site being determined, as ere, by accident, and it is frequently complicated by inflammation. luch mischief has resulted during the past eighteen years from the of accurate knowledge as to the true pathology of these cases. ld the views which are now being presented prove, on further tigation, incorrect, the error, at least as taught, will produce harm. Since the practice of indiscriminate division of the cervix rst introduced by Prof. Simpson, more malpractice has been uated throughout the world by this simple operation, than by er procedure known to the profession. For years past, the nt of flexures has consisted in a resort to surgical means, to of the intra-uterine stems, or to frequent dilatation.

ntra-uterine stem and the practice of dilatation for the treatflexures might, with our present views of the pathology, be dismissed without further comment. But, unfortunately, members of the profession are frequently advocating the use of the stem pessary, regardless of the experience of those who have gone before them, until they in turn learn that they have not been wiser in their day. As soon as the true condition comes to be appreciated, the use of the intra-uterine stem will be abandoned as a most irrational instrument. Experience will at last teach every one that no permanent benefit is ever derived; and that no degree of tolerance is ever established; but that sooner or later, in almost every case, mischief will result from the use of the instrument. I have long taught that its use in a flexure would be as irrational as the introduction of a straight steel sound into the urethra for the relief of chordee; the penis might be straightened by force, but the cause of difficulty would certainly not be removed. Were we to straighten out a flexure of the cervix by means of an intra-uterine stem, the end of the instrument would make continued pressure on the posterior wall of the vagina by that portion which projected from the canal. So much disturbance, in an American woman at least, would be excited in the vagina and uterus that inflammation would certainly be established if its use were persevered in. Then, as soon as the instrument is removed, the neck will return to its original condition.

If this instrument be employed with a flexure of the uterine body, the disturbance is likely to be even more marked. A condition here exists which so closely resembles an inflammatory one, that the slightest provocation is often sufficient to establish cellulitis and, even, general peritonitis. Whenever, by sanction of a merciful Providence, the stem has been tolerated for a time, even in this condition, no more progress will have been made towards removing the existing cause of the flexure than would be accomplished by the sound in a case of chordee. Moreover, were its use entirely successful, so far that the canal remained perfectly straight, and patulous afterwards, the cause of the flexure would remain, and the pain of menstruation would, in all probability, be increased in consequence of the new disturbance.

The same objections are to be advanced against the practice of dilating with either steel sounds or the sponge tent, so far as they may be employed for the relief of a flexure of the uterine body. The use of the curved sponge tent, which I was accustomed to employ fifteen years ago to straighten a flexure, produced less irritation than the passage of a number of the steel dilators for the same purpose. But the use of either is faulty in theory, and without permanent benefit, and the practice is always attended with risk.

There are certain forms or conditions of flexure, in which we must resort to surgical means for relief, and there are others in which it would be malpractice to do so. It may be accepted as a truism, learned from experience, that, in flexure of the uterine body, no surgical procedure will be of the slightest use towards permanently removing the abnormal condition; and that whenever practised, the life of the patient is thereby unnecessarily placed in jeopardy. The only exception to the rule is when a flexure of the body forward has so long existed, that from absorption of tissue at the angle, the condition has become a permanent deformity. In this state, after the proper preparatory treatment, as we shall see, an operation is sometimes advisable.

Quite different is the condition where the flexure is below the vaginal junction. The body of the uterus is then found, as a rule, in position at a right angle to a long and pointed neck which presents in the axis of the vagina. This lesion has been attributed to a fault in nutrition, and is one which only by accident is ever complicated by inflammatory action. Both dysmenorrhœa and sterility exist, as a rule, with this condition, but, as has been already shown, there is little or no uterine disease until at a somewhat advanced period of married life. This is one of the commonest of the mechanical causes of sterility, and when surgical means can be applied at an early period, the result has proven, in my experience, very satisfactory in removing the sterility, and in affording relief to the painful menstruation. But these results are only gained, in so satisfactory a manner, in simple uncomplicated cases of flexure of the cervix, such as we find shortly after marriage, in early life, and before any form of uterine disease has supervened. Yet, in only a small percentage of flexures of the cervix are we justified in resorting to surgical means. It should never be performed on the unmarried woman, except in extreme cases of dysmenorrhœa, when the neck is unusually long. This should not convey the impression that I am in favor of neglecting the treatment of an unmarried woman because she is unmarried. A large proportion of them may become impregnated after marriage, notwithstanding the existence of flexure. I do not, therefore, advocate the operation if it can be avoided, and if there should be any prospect of marriage. The woman should receive the same local treatment as would be deemed applicable in any case where the degree of flexure was not sufficient to justify an operation. For the sterile woman, the operation should be performed after a reasonable delay, whenever the dysmenorrhœa is severe and has increased since marriage, but it will prove of little value for the relief of sterility if it has existed without painful menstruation. Whenever the cervix is of unusual length, the operation is necessary to remove a condition which, from sexual intercourse, is likely to result in retroversion. With this displacement, prolapse and increased elongation of the cervix afterwards take place, as the body of the uterus becomes forced over into the axis of the vagina.

The ultimate result of the operation is to bring the neck of the uterus to a more natural length, after which it becomes straighter, shorter, and thicker. The change is brought about, it is supposed, by the contraction of the longitudinal fibres, after the circular ones have been divided. The course of the muscular fibres of the cervix is not so well defined as of those in the body of the uterus, being more matted together; consequently, this explanation should not be accepted absolutely. Of the result, however, there can be no doubt; but we must leave the question to be determined by others, whether it is produced by contraction of the cicatricial surfaces of the divided cervix, opposite the flexure, or by muscular contraction.

Sir James Y. Simpson first proposed and practised a lateral division of the cervix for overcoming a narrowing of the canal, and for opening the passage when encroached upon by a flexure. The results of this practice were not entirely satisfactory, so that, about 1860, Dr. Sims's ingenuity suggested an incision of the posterior lip backward in the median line. After a few operations had been performed by him, he returned to the lateral method, and at the time of his leaving the country in 1862 that was his usual practice. While in Europe he seems to have revived the original operation, and has recently resorted to it more frequently. But, as far as I have had the opportunity of judging, my impression is that the lateral operation was, as a rule, his usual practice until recently. Having had the opportunity of observing the results of his practice more closely than he could himself, and also by watching my own, I became satisfied that neither mode of operating will relieve the flexure of the uterine body. As early as 1865, I placed on record the views I then held, and had already taught for several years previous. These views were nearly the same as I hold to-day, both in relation to the pathology and the treatment of flexures. I then wrote,[1] "I am satisfied that neither operation will permanently relieve any case, unless the flexure is confined to the neck, and is below the vaginal junction. While the backward operation, as proposed, would relieve a moderate flexure, the lateral one, even if extended on each side to the vaginal junction, could not accomplish so much, unless the posterior flap in the process of healing retracted sufficiently to clear the seat of stricture, which it could not do. The dysmenorrhœa invariably returns after a few months, so soon as the more revulsive effects of the operation have subsided." My views at that time were that a much larger proportion of flexures needed the operation, but more especially for the purpose of facilitating the application of after treatment to the canal. The additional experience of twelve or thirteen years has only confirmed me the more in limiting the operation to a flexure of the cervix, with the single exception which has been cited.

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[1] "Treatment of Dysmenorrhœa and Sterility, resulting from Anteflexure of the Uterus." New York Medical Journal, June, 1865.

With the other advantages equal, the backward operation is preferable to the lateral one, since by it the cervix is divided only in one direction, and the risk from hemorrhage is less, as the circular artery can be easily avoided. Moreover, there will be no gaping or rolling out of the edges after they have healed, as the flaps will be kept sufficiently in contact by the lateral walls of the vagina. When we come to consider the effect of laceration of the cervix which occurs at childbirth, the bearing of this fact upon the eversion of the flaps will be better appreciated. Another objection, and in fact the most important one, to be urged against the lateral operation, is the greater liability to the occurrence of cellulitis after it. In the lateral operation the cervix is divided on both sides, consequently it may be justly claimed that the risk is at least twice as great as when it is simply incised backwards. But the danger from the lateral operation is still further greatly enhanced by the fact that, when the cervix is divided laterally to the vaginal junction, the incisions go down to, and frequently into, the cellular tissue of the pelvis inclosed on each side between the folds of the broad ligament. These incisions are thus made in close proximity to immense plexuses of veins and venous sinuses in the uterus itself, which are more numerous nearer to the lateral surfaces, so that these may become readily involved by any local inflammation. In the backward operation, it is never well to extend the incision to the vaginal junction, although there really exists but little cellular tissue in this neighborhood likely to become involved.

The operation is now generally performed with either the knife or scissors. Simpson's uterotome was first employed, but there were so many objections to it that Dr. Sims devised an instrument for the purpose, having a narrow cimeter-shaped blade which, with my modification, has been described in the chapter on Instruments, page 43.

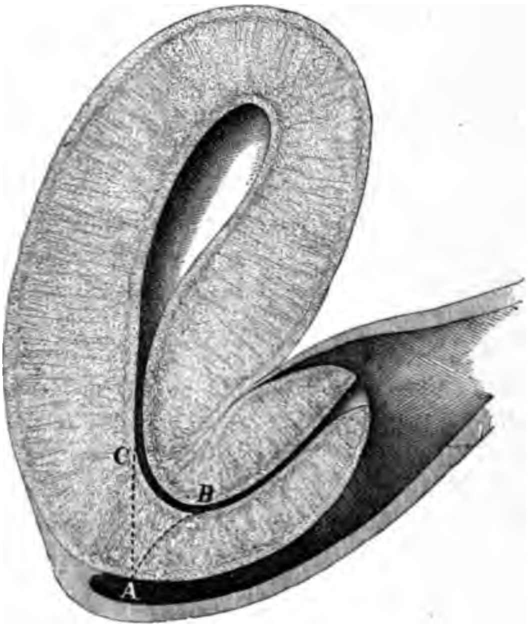
[illegible] the scissors, of which a cut is given on page [illegible] operation. These scissors were the first used for [illegible] interest from being the first of the various fo [illegible] Their introduction was of no little importa [illegible] impulse to this branch of surgery and [illegible] for performing many operations in which the k [illegible].

[illegible] quoted from (written in 1865), I stated "I ha [illegible] this, as in all other operations of obstetrical su [illegible] far as possible, the use of the scissors for th [illegible]

[illegible] that I have been in the habit of using for this opera- [illegible] but have the blades bent at an angle from the [illegible] somewhat to the direction of the uterine [illegible] the scissors for the operation, since, in addition t [illegible] of blood, I am certain that the risk from blood [illegible] great after the parts have been crushed apart b [illegible] separated by a clean cut. The process of healing i [illegible] less rapid after the use of the scissors.

[illegible] time for performing the operation is within a few day [illegible] of the menstrual period; but it should not be under- [illegible] the slightest tenderness can be detected in the vagina [illegible] the finger. An excellent feature in the preparatory [illegible] administration, once or twice a day, of a large ho [illegible] injection. As an essential, before every operative pro [illegible] necessary that the bowels should be emptied within a fe [illegible] the operation. The patient is to be placed on the lef [illegible] prepared table, with her body, as well as her limbs [illegible] to cold. After introducing the speculum th [illegible] the uterus is seized, and drawn gently forward, whic [illegible] series of small radiating folds to be formed passin [illegible] utero-vaginal junction at the bottom of the cul-de [illegible] the guide in limiting the incision through th [illegible] not to wound the circular artery. While the cer [illegible] means of the tenaculum, a probe is introduced t [illegible] guide before making the incision. The tenaculum [illegible] then be held in one hand, and with the other th [illegible] One blade of the scissors is to be introduce [illegible] canal, alongside of the probe, to a sufficient dept [illegible] through the posterior lip, stopping just short o [illegible] the point from which the folds radiate, as ha been described. It will be seen by a glance at Fig. 54, that the blades of the scissors must necessarily move in an arc of a circle approximating to the line A B, leaving the part represented by the triangle A B C uncut. To incise this I use the ball-and-socket-joint (see page 43), passing the blade, with its sharp edge backward, along the probe as a guide, into the canal beyond the point C, and cutting as deep

Fig. 54.



Lines of incisions in flexure of the cervix.

as the line C A, as the instrument is withdrawn. The probe is then removed, and, by passing an ordinary uterine sound, it can be ascertained how far the canal has been laid open and whether there is any necessity for extending the incision. After a few moments' delay, to ascertain the extent of bleeding, the vagina can be tamponed to prevent further loss of blood. We may use for the tampon either damp cotton, which has been saturated with a solution of alum, and afterwards squeezed nearly dry, or a fine quality of oakum. After an operation of this kind the oakum is preferable, if the best quality can be obtained. It has in itself disinfecting properties, and when properly introduced does not shrink in bulk, as the cotton tampon always does after a few hours. In a previous chapter, the use and mode of introducing the tampon are fully treated of, and it is therefore unnecessary to repeat these directions. Before introducing the tampon, a portion of cotton, saturated with glycerine, should be passed, by means of the applicator, well into the cervical canal, and be allowed to remain packed between the cut surfaces until loosened by commencing suppuration. The vagina should be well filled by the tampon, as if a hemorrhage actually existed at the time, since it is far easier to prevent hemorrhage than it is to arrest it after it has once begun. Vessels situated in loose cellular or erectile tissue, do not retract, to the same extent as elsewhere, when divided, and become much dilated from the rotatory force of the escaping current.

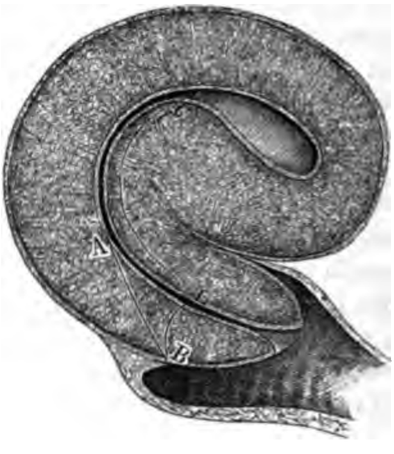
It is a fact well known in hydraulics, that the amount of fluid which can escape from a pipe, in a given time, will vary according to the shape of the orifice. When the orifice is trumpet-shaped, as it is in dilated vessels, the escape of fluid in a given time will be manifold greater than from an opening made only equal in calibre to the diameter of the pipe itself. Therefore, the rapidity with which the blood will escape from one of these vessels increases with the time the flow is allowed to continue. I have frequently noticed the mouth of a divided vessel in this tissue increase rapidly in size from a mere point to an orifice sufficiently large to admit the extremity of a probe. The occurrence of hemorrhage should be guarded against, not only for the exhaustion it induces, but because it also renders the patient more liable to inflammation. This may take place not only from the greater volume of blood which would naturally flow to the parts, but in consequence of the exposure to which the patient must be subjected in the attempt at arresting the hemorrhage. Frequently, the bleeding at the time of the operation is sufficient to make the use of a large tampon necessary as a precautionary measure. This will often excite irritation from the pressure produced at the neck of the bladder, which, if not relieved, will cause much suffering to the patient. To guard against this, a suppository of morphine and belladonna may be introduced into the rectum, immediately after completing the operation, or an enema of some preparation of opium may be used for the same purpose. After the lapse of a few hours, a portion of the tampon from the immediate neighborhood of the neck of the bladder may be removed if there is no indication of hemorrhage at the time, and this will be made evident by the appearance of the cotton at the vaginal outlet. To enable the operator to remove the cotton with safety, it is necessary that the patient should be perfectly still. Her shoulders should be shifted to the middle of the bed by drawing on her pillow, so that her body will lie across the bed with her limbs drawn up, and her hips resting near the edge. The index finger, as a guide, can be gently introduced into the vagina, without exposure of the patient, and alongside of it can be passed the forceps, or the notched whalebone stick. By twisting the end of the stick into one piece of cotton after another, a sufficient quantity can be removed to give entire relief. But unless this necessity exists, the patient should not be disturbed until the second day after the operation, when the tampon must be carefully withdrawn and renewed. To do this properly, it will be necessary to place the patient on the table, and to make use of a speculum. The tampon is to be removed piece by piece until the cervix becomes exposed, but, to avoid causing hemorrhage, the plug between the sides of the wound should remain undisturbed until the third or fourth day, when it will become loosened by suppuration. Before replacing the tampon, I make it a rule to swab out the vagina with hot water as thoroughly as can be done, by means of a large piece of sponge upon a probang, or in the grasp of a pair of forceps. Then over the cervix is to be placed some cotton saturated with glycerine, to which should be added a few drops of impure carbolic acid, and afterwards the tampon. As soon as the plug or tent in the wound can be removed readily, and the wound begins to discharge, the granulating surfaces may be cleansed by carefully throwing in a little warm water by means of a syringe. A fresh plug of cotton, saturated with glycerine, should be introduced daily between the edges of the wound, but, before doing so, the sound must be passed with care into the uterine canal, so that, as it is being removed, its point may be drawn with sufficient pressure along the angle of the wound to keep it from uniting too rapidly. For the first five or six days, but little more will be needed than to break up the healing in the angle just at the vaginal junction, for at this point the union will first begin, and contraction rapidly follow. The tampon may be lessened in size after the second removal, according to the tendency to hemorrhage, and after the tenth day may, as a rule, be discontinued. But it will be then necessary to resume the vaginal injections in the morning, with a glycerine dressing afterwards.

The patient cannot be watched with too much care, to guard her against exposure to cold and consequent inflammation, which is almost always brought on by some imprudence on her part. For the subsequent examination, she should be protected by stockings and drawers, and be lifted from the table to her bed while wrapped in a blanket which is to cover her from the shoulders to the feet. When necessary, she must use the bed-pan in the recumbent position, if possible, but if she is unable to empty the bladder while in this position, the catheter must be used during the first week. As a rule, it is not safe for a patient to sit up until at least ten days after the operation, and the dysmenorrhœa which always accompanies this form of flexure of the cervix. But experience at length taught me that no relief can be obtained by any surgical means, so long as the body of the uterus remains retroverted, and that any operation of the kind is always attended with great danger. Whenever the fundus becomes so much displaced backwards as to cause a flexure in either the body or the cervix, inflammation will have long before been excited in the neighboring cellular tissue as a consequence of the malposition. As long as the displacement of the uterus exists, an irritable condition will remain latent, and it will then require much less provocation than a division of the cervix to establish the inflammation in full force. To my sorrow, I have had pelvic cellulitis with abscesses frequently occur, and death in one instance, after the most careful preparatory treatment previous to dividing the cervix of a retroflexed uterus, when, at the time, there was not the slightest indication of danger. In fact, I am unable to recall a single instance where inflammatory symptoms did not occur, if an attempt was persevered in to keep open the incision while the uterus remained in this position. The uterus must be gotten into a favorable position or anteverted by a pessary, as shown in Fig. 52, page 323, when, if the cervix is too long, it may become flexed in the opposite direction. Then, if necessary after the proper preparatory treatment, the cervix may be divided backward.

In the treatment of flexures of the uterine body, we are to be guided by the same general principles as would be applicable to the treatment of disease of uterine condition without the accident of flexure. We may, however, accept the presence of the flexure as conclusive evidence that the most careful general treatment will be necessary, and without it the local means to be employed will prove of little value. Just in proportion to any improvement which can be brought about in the general condition to influence and give tone to the pelvic vessels, will the degree of flexure be lessened. The chief local means to be employed for giving tone to the vessels and removing the chronic state of venous stagnation will lie in the proper use of the hot-water vaginal injections. The frequent use of iodine will be of service when applied throughout the canal by means of the applicator, after this has been bent to the proper curve, corresponding to the degree of flexure, as ascertained by the use of the probe. When the uterus is enlarged, and the cervix hard, a blister of the acetic solution of cantharides applied to the neck, shortly after each period, will be of service. This agent will relieve the local congestion by the watery discharge it produces; the revulsive effect will prove beneficial also, and the remedy is further valuable in exciting uterine contractions. The daily use of glycerine, to be applied in the vagina by saturating with it a sufficient quantity of cotton, will prove indispensable. Whenever the stomach will tolerate the use of small doses of ergot in some form, the remedy should be given in conjunction with tonics, since its effect on the pelvic and uterine circulation will prove most beneficial. But to obtain the wished-for result from this agent, its use must be long continued, and in such doses as not to cause any disturbance of the stomach or marked uterine pains, since the latter would establish a condition calculated to increase the degree of flexure.

It has already been stated that, in consequence of long-continued pressure at the angle of flexure, absorption of tissue gradually takes place, leaving a condition of permanent deformity. With this condition existing, and with the disappearance of all evidence of cellulitis, it is the proper treatment to open the passage sufficiently that the flexure may no longer produce dysmenorrhœa, or, by retention of the secretions within the canal, maintain an exciting cause for future disease or return of the inflammation. Fig. 55 is intended to illustrate a flexure of the body above the vaginal junction, which has remained unchanged after the proper treatment. For the operation, the same directions are applicable as have already been given. The posterior lip is to be divided backward by scissors along the probe in the canal as a guide, in the median line to B D, and then the triangular portion A B D is to be incised by means of the ball-and-socket knife.

Fig. 55.



Lines of incisions in flexure of the body.

The blade of the knife is then to be reversed, with its cutting edge towards the operator. The uterus must be steadied with a tenaculum held in the same hand with the probe, which had been previously introduced to the fundus to serve as a guide. The blade of the knife can then be passed alongside of the probe, when it will divide rather more than its width, as shown by the line D C, and this will complete the operation. The after treatment is to be essentially the same as that already described for division of the cervix. This operation, when performed at the proper time and under the proper circumstances, is often followed by very satisfactory results. Yet in my experience it has often failed, and there has been a gradual return to the previous condition, and sometimes the contraction has been even greater than existed before the operation.

During the period from Sept. 1, 1862, to May 1, 1872, while I held the position of Surgeon-in-Chief to the Woman's Hospital, there were eighteen hundred and forty-two patients treated under my direction in the institution. Of this number, the cervix was divided fifty-six times for flexure. There were three cases of serious cellulitis following these operations, but complete recovery took place in each instance, and without the formation of pelvic abscesses. Two deaths occurred as the result of general peritonitis, brought on after these patients were well enough to be up, caused by their own imprudence just as the first menstrual period after the operation was coming on. One of these patients was sent to the hospital by Dr. Bauer of Brooklyn, but now of St. Louis. After she had been up for several days, she asked permission to take a bath, which was refused, and she was reminded that her menstrual flow would soon be due. Notwithstanding this caution, she took a cold sponge bath with her window open, on a mild day, as it happened, although in the middle of winter. She was seized with a chill before she had completed her toilet, and this was followed by a violent attack of peritonitis, of which she died in a few days. The other case, I had operated on just before the change in the organization of the Woman's Hospital, in May, 1872, and, after a few days, she passed from my service. She continued to do well until three weeks after the operation, when on going out for the first time, she imprudently indulged in too long a drive, was taken sick before her return, and died within a few days from general peritonitis.

From the autumn of 1862 until the same season in 1875, when I began to arrange the statistical material which has been used in this work, I had treated two thousand and thirty-six cases in my private hospital. Of this number, there had been forty-nine cases of flexure where the cervix had been divided, and from which one death had occurred. The cause of death was general peritonitis coming on in a case where I imprudently performed the operation on the day after her arrival from a long and fatiguing journey—to oblige her physician, who insisted on returning home without delay. In this instance, the patient did well for a week, when the menstrual flow came on, I believe, at the regular time, but she had, through ignorance, or with the view of avoiding the delay, misrepresented the fact. Having had the good fortune, in early life, to witness the results in the practice of others, I made it a rule never to perform this operation outside of either the public or private hospital. I felt that by this plan alone would a patient be kept sufficiently under control to protect her from her own imprudent acts. Consequently, I have never operated but twice outside, and both cases remained afterwards under the charge of their physicians. One of these ladies suffered from a retroflexion; she was a foreigner with whom I was unable to hold any personal conversation. The operation was performed in a large hotel, where she could not get the proper care, and she suffered, I have no doubt, from exposure. The consequence was an attack of cellulitis, which terminated in a pelvic abscess, from which she died after many months of suffering.

Formerly, cellulitis after this operation was not an infrequent occurrence in my private hospital, and I have had several instances of pelvic abscess occur, from which, however, recovery finally took place. But, for years past, I have had no difficulty, since I have appreciated the necessity for carrying out in detail the precautions which I have endeavored to impress upon the reader.

When the uterus has become retroflexed, the fundus must be gotten out from the hollow of the sacrum as soon as possible. But frequently the uterus is found bound down by adhesions, or in too tender a condition to be moved with safety. We must, as in the treatment of other flexures, resort to the continued use of hot water injections, hot baths, blistering the cervix occasionally, daily glycerine dressings, with the most careful attention to the state of the bowels and the general health. By degrees, as the tenderness on pressure subsides, the fundus should be lifted day after day, as far as prudent, and without attempting too much at any one time. I have succeeded, after months of careful daily manipulation, in restoring the uterus to a normal position, and in causing the gradual disappearance of a fixed flexure, although, in the beginning, the organ was apparently bound down by adhesions.

CHAPTER XIX.

PROCIDENTIA, OR PROLAPSE OF THE UTERUS.

Causes—Etiology; Table XXXI., showing the relation of procidentia to age, pregnancy, injury, labor, and other conditions—Treatment, pessaries, surgical measures—Cystocele—Rectocele.

This condition may exist in any degree, from a simple sagging of the organ to the entire escape of the uterus from the vagina. By general usage the term procidentia is applied more to the condition of prolapse where some portion of the organ has already passed the labia. Prolapse of the posterior, or recto-vaginal, septum, constitutes what is termed a rectocele, and the same condition of the anterior, or the vesico-vaginal wall, forms a cystocele. In practice, procidentia and prolapse have been generally regarded as two distinct lesions. I shall, however, treat of the subject as a displacement of the uterus, where each of these conditions will be regarded as only steps in a process which may terminate in the complete escape of the uterus from the vaginal outlet.

The immediate causes of prolapse are threefold, either some growth above tho uterus crowds it downward, or there is an increase of weight in the organ itself, or there is a want of proper support below. The first step in the process is usually to be traced directly to the absence of support for the vaginal walls at the outlet of the passage, from which a further descent is soon induced by the increase in weight of the organ resulting from its malposition. To whatever cause the increase in size and weight of the uterus may be due, the organ will settle into the pelvis just in proportion to the additional burden.

Complete procidentia is essentially a condition of middle life or old age, and occurs usually in those who have given birth to more than the usual number of children. But I have seen it occur in young unmarried women, in consequence of tenesmus excited by dysentery, or from lifting, by which the uterus became at first retroverted. I have also met with several instances in which the displacement was caused by uterine contraction, in the attempt of the organ to drive hospital. Of this number, there had been forty-nine cases of flexure where the cervix had been divided, and from which one death had occurred. The cause of death was general peritonitis coming on in a case where I imprudently performed the operation on the day after her arrival from a long and fatiguing journey—to oblige her physician, who insisted on returning home without delay. In this instance, the patient did well for a week, when the menstrual flow came on, I believe, at the regular time, but she had, through ignorance, or with the view of avoiding the delay, misrepresented the fact. Having had the good fortune, in early life, to witness the results in the practice of others, I made it a rule never to perform this operation outside of either the public or private hospital. I felt that by this plan alone would a patient be kept sufficiently under control to protect her from her own imprudent acts. Consequently, I have never operated but twice outside, and both cases remained afterwards under the charge of their physicians. One of these ladies suffered from a retroflexion; she was a foreigner with whom I was unable to hold any personal conversation. The operation was performed in a large hotel, where she could not get the proper care, and she suffered, I have no doubt, from exposure. The consequence was an attack of cellulitis, which terminated in a pelvic abscess, from which she died after many months of suffering.

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Complete procidentia is essentially a condition of middle life or old age, and occurs usually in those who have given birth to more than the usual number of children. But I have seen it occur in young unmarried women, in consequence of tenesmus excited by dysentery, or from lifting, by which the uterus became at first retroverted. I have also met with several instances in which the displacement was caused by uterine contraction, in the attempt of the organ to drive out a pedunculated fibrous polypus. In these cases, the procidentia remains complete after the expulsion and sloughing away of the polyp.

Laceration of the perineum, or a patulous state of the vulva, must be present in every instance before the procidentia can become complete. If the pressure from above is sufficient to crowd the retroverted uterus down against the perineum, this will become gradually distended, and the neighboring tissues so thinned out from absorption, as no longer to offer sufficient resistance.

In practice, we will have to deal with the effects of childbirth as the most common of all causes in producing procidentia, and in all these cases the perineum will be found extensively lacerated. Under certain circumstances, the neck of the uterus becomes lacerated, and whenever this accident occurs, it will always keep up a sufficient irritation to arrest the involution, or natural decrease in the size, of the organ after childbirth. The increased weight of the uterus causes it to descend and rest upon the floor of the pelvis, where it acts as a wedge to keep the vagina dilated; and the cervix soon presents at the vaginal outlet. Frequently, the same cause which produces laceration of the neck of the uterus will also split the perineum, and when this accident has occurred to an unusual degree, so little resistance is opposed to the descent of the uterus that the procidentia soon becomes complete. From a want of support below, the recto-vaginal wall often prolapses and forms a rectocele. Along the sulcus, on each side, the walls of the vagina are attached to the connective tissue and fasciæ of the pelvis, from which the canal receives much support. As fold after fold of the posterior wall of the vagina becomes prolapsed, the connective tissue of the pelvis will, in turn, stretch sufficiently to throw the weight on a portion beyond, until, at length, the uterus is reached, and as soon as the utero-sacral ligaments have been stretched sufficiently, the uterus becomes retroverted. As the organ then settles towards the vaginal outlet, the anterior wall of the canal prolapses from behind forward, and forms a cystocele. The tissue just posterior to the neck of the bladder will then be the last to escape as the procidentia becomes complete.

When laceration of the perineum occurs, and the enlarged uterus happens to be left anteverted, the cervix will settle on the floor of the pelvis with the fundus behind the symphysis. This position will also keep up the hypertrophy, but complete procidentia cannot take place unless the uterus happens to become retroverted. But having no support at the outlet, the tissues about the urethra soon thicken, and, in turn, begin to prolapse. This relaxation will in time involve the whole septum between the vagina and bladder, so that the mass will, at length, protrude from the vagina as a cystocele. After a cystocele has once formed, with a laboring woman, it will be but a question of time before the uterus becomes retroverted. This displacement will facilitate a prolapse of the recto-vaginal wall, and after both a cystocele and rectocele have formed, the procidentia will soon be complete.

In early life, even when the perineum is extensively lacerated, the occurrence of a procidentia is not the rule unless it is induced by accident, or by the character of the woman's occupation. A woman with a moderate degree of laceration may bear a number of children afterwards, and between each pregnancy the uterus may remain enlarged and lie on the floor of the pelvis for years, without any apparent increase in the amount of prolapse. At length the time arrives for the change of life, but there will be no diminution in the size of the uterus, and this critical period will be manifested only by an increase in the length and quantity of the menstrual flow, and, finally, the usual changes in the vagina, *i. e.*, the posterior cul-de-sac disappears and the canal becomes shorter and lessened in diameter. The effect of this is to bring the uterus much nearer to the outlet, retroversion naturally follows, and it then requires but little more exertion to complete the procidentia. Then the uterus, being relieved from any obstruction to its circulation, soon undergoes the natural change and becomes atrophied, but the displacement continues to exist unless relieved by art.

Etiology of Procidentia.—By means of Table XXXI., a comparison will be made between those who suffered from procidentia. These were, as to one class, treated in my private hospital, and as to another in the Woman's Hospital. With the one, every comfort of life had been enjoyed; with the other, want had doubtless been the rule.

Those treated in the private hospital had had, without exception, the advantage of the best medical attendance during labor. The contrary, however, was, in all probability, the rule with the greater number of those admitted to the Woman's Hospital.

This table does not include all who were treated for this lesion in the Woman's Hospital, since a number were discarded in consequence of some serious defects in their record. All of those in the Woman's Hospital were operated on previous to May, 1872, and during the time I had charge of the institution. Those from my private hospital were treated previous to Jan. 1874.

In explanation of Table XXXI., we will take as an example the total number who suffered from procidentia. It will thus be shown

TABLE XXXI.—*Showing the relation of Procidentia, and its several stages, to Puberty, Marriage, Change of Life, etc.*

			Age at the time of			Number of pregnancies.					Length of time since receiving the injury.	Average number of years since last pregnancy.	Age at change of life.	Average in years since change of life.	Age at the time of injury.	Average labor in which the injury was received	Character of the labor when injured.										First noticed the displacement.	
						Before injury.		After injury.																				
			Admission.	Puberty.	Marriage.	Children.	Miscarriages.	Children.	Miscarriages.	Average number of pregnancies.							Not stated.	Natural.	Rapid.	Tedious.	Forceps.	Turning.	Traction.	Pairs of twins.	Large children.	Retained placenta.	A certain time before the change of life.	At an average age after the change of life.
Procidentia.	Private Hospital.	Number	42	41	41	42	8	7	8	....	41	....	15	....	42	30	27	1	1	7	..	..	3	2	1	..	30	12
		Average	44.26	14.29	21.85	4.45	2.87	2.42	2.12	5	9.00	11.19	46.13	7.04	35.00	3	..	..	..	..	..	..	..	..	..	..	10.60	52.58
	Woman's Hospital.	Number	44	37	35	44	13	12	6	....	41	....	5	....	43	38	17	4	..	4	8	3	1	3	3	1	37	5
		Average	39.18	15.21	25.31	3.20	1.53	2.16	1.00	4	6.79	6.58	48.80	7.40	32.34	2	..	..	..	..	..	..	..	..	..	..	7.32	50.00
	Total	Number	86	78	76	86	21	19	14	438	85	7.53	20	....	85	68	44	5	1	11	8	3	4	5	4	1	67	17
		Average	41.66	14.73	28.44	3.82	2.04	2.26	1.64	5	7.85	8.85	46.80	7.12	33.24	2	..	..	..	..	..	..	..	..	..	..	8.64	51.58
Rectocele.	Private Hospital.	Number	45	45	45	45	6	15	2	....	45	....	8	....	45	38	21	3	1	7	4	3	..	4	3	..	40	5
		Average	37.33	14.04	23.20	2.35	2.55	2.55	1.50	3	7.06	7.75	45.87	6.02	29.95	2	..	..	..	..	..	..	..	..	..	..	8.87	47.60
	Woman's Hospital.	Number	22	13	16	22	5	10	3	....	22	....	5	....	21	18	8	1	2	1	7	..	1	..	1	1	19	2
		Average	34.77	14.23	22.62	2.31	1.20	2.20	1.00	3	6.90	4.40	47.20	4.00	28.19	2	..	..	..	..	..	..	..	..	..	..	7.50	48.50
	Total	Number	67	58	61	67	11	25	5	....	67	....	13	....	67	56	28	4	3	8	11	3	1	4	4	1	59	7
		Average	36.49	14.08	21.40	2.32	1.90	2.40	1.20	3	7.01	6.65	46.38	5.15	29.69	2	..	..	..	..	..	..	..	..	..	..	8.44	47.85
Cystocele.	Private Hospital.	Number	17	17	17	17	5	1	..	....	17	....	8	....	17	9	15	1	..	..	1	..	..	..	..	..	9	8
		Average	40.05	13.94	20.58	4.23	2.00	1.00	..	4	5.52	5.52	47.25	3.87	36.00	2	..	..	..	..	..	..	..	..	..	..	5.33	46.25
	Woman's Hospital.	Number	10	7	9	10	2	1	..	....	10	....	1	....	10	9	1	3	..	2	1	..	1	1	..	1	9	1
		Average	38.70	13.42	20.22	4.00	4.00	1.00	..	4	6.70	9.10	50.00	6.00	32.00	3	..	..	..	..	..	..	..	..	..	..	6.86	50.00
	Total	Number	27	24	26	27	7	2	..	....	27	....	9	....	27	18	16	4	..	2	2	..	1	1	..	1	18	9
		Average	39.55	13.79	20.46	4.16	2.57	1.00	..	4	5.96	6.85	47.55	4.11	34.51	2	..	..	..	..	..	..	..	..	..	..	6.11	46.66
Total.	Private Hospital.	Number	104	103	103	104	19	23	10	....	103	....	31	....	104	77	62	5	2	14	5	3	3	6	4	..	79	25
		Average	40.57	14.12	21.26	3.59	2.52	2.43	2.00	4	7.58	8.86	46.35	5.91	32.04	2	..	..	..	..	..	..	..	..	..	..	9.00	41.56
	Woman's Hospital.	Number	76	57	60	76	20	23	9	....	76	....	11	....	74	65	20	8	2	7	16	3	3	4	4	3	65	8
		Average	37.57	14.79	23.83	3.05	1.70	2.13	1.00	4	6.76	6.19	48.18	6.87	31.08	2	..	..	..	..	..	..	..	..	..	..	7.16	40.73
	Total	Number	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ı to the labor in which the injury was supposed to have been
ved. Nineteen of these afterwards gave birth at full term to
ren, while 14 miscarried. Altogether these 86 women were im-
nated 438 times, averaging over five pregnancies to each woman.
ı 85 of these, it is shown that the average time, previous to
ssion, and since the reception of the injury, was 7.85 years. A
of 753 years had elapsed since the last pregnancy, which would
an average of 8.85 years for each woman. It will be seen that
omen, of the total number of 86, had already gone through a
ge of life, on an average of some seven years, before seeking
f, and at the average age of 46.80 years. It is also shown that
average age at which the injury was supposed to have been re-
d was over 33 years, and it was not generally until after the
, of the second child that the injury occurred.

nally, the connection is noted between the time of undergoing
hange of life, and the first appearance of the displacement. Thus
omen, with complete procidentia, had first noticed the displace-
; at an average of eight years or more before seeking relief, and
of these had then had a change of life. But with 17 women
change had already occurred, and afterwards at the average age
1.88 years, the procidentia took place.

› far as we are justified in drawing any deductions, in proof of a
ral law from so small a number, it is evident that laboring women
relief at an earlier age than those in the upper walks of life. In

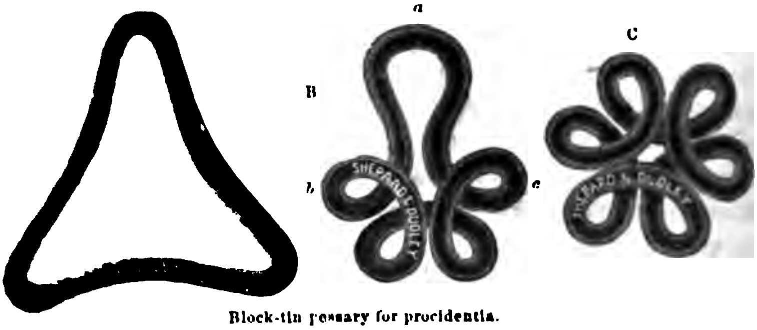
time, and was not disturbed except to receive her food or answer a call of nature. From others I have since learned that his statement was correct, so far at least as his success in the treatment of this displacement was concerned. Although this plan would not be practicable for any other race, and is so but to a limited extent among negroes, yet I think the principles of the treatment were correct.

Procidentia, as we have seen, may be due to an enlarged uterus, remaining settled, from some cause, on the floor of the pelvis after labor. The already over-stretched vagina cannot regain its normal size, nor the uterine ligaments recover their integrity, so long as the uterus occupies this malposition and acts as a wedge to continually increase the dilatation.

If it were possible to lift and maintain the uterus at its proper position in the pelvis, the organ would be able, in all probability, to regain its natural size. But under any circumstances, by correcting the malposition, the vagina and other supports of the uterus are enabled to return to a normal condition. With a large and relaxed vagina this cannot be done by any mechanical means yet devised. Beyond a certain point these means are futile, and a pessary, in any form, will prove of but temporary benefit, and in the end be positively detrimental. When the vaginal walls have become very much relaxed, it is impossible to prevent them from crowding down within the fenestra of any form of open pessary, and it may occur to an extent almost producing strangulation, unless the instrument be of a sufficient length to put the passage on the stretch. In either case the result is the same; the capacity of the vaginal canal is increased, and the uterus is still further enlarged owing to the yet greater obstruction to its circulation. When a solid instrument is used, the capacity of the canal is also increased by the walls crowding in around it, and pressing it forward as a dilator. One instrument after another will be resorted to with the necessity of making each subsequent one larger, until finally the canal may be dilated to the full extent of the pelvic passage. The patient must then become bed-ridden, or she may be relieved of the most urgent symptoms as the uterus escapes from the vagina and the procidentia becomes complete.

Some surgical procedure must be our final resource, but it is always advisable to administer preparatory treatment previous to the operation. Should the uterus be much enlarged, treatment directed to diminish its size would add greatly to the chances for success from an operation. An erosion should always be healed beforehand, and when the cervix has been lacerated, the surfaces should be united, ice the size of the uterus. It is uterus, which is usually retroverted, or to pelvis, if it simply sags from increased uterus is placed in a position where the cir- established, it will decrease rapidly in size. adjust any form of pessary for correct- the perineum has been lost, and the only s behind the symphysis. Yet, by having ration, and by studying the peculiarities of lished. Whenever tenderness on pressure must be applied from time to time, and the steadily employed. We should never sting indication of cellulitis, and whenever there enderness at any point as to contra-indicate the must resort to other means for gaining the India-rubber disk may sometimes answer, or a like a mushroom, and saturated with glycerine. Whenever a pessary is employed, it must be care, for when such a redundancy of tissue become readily strangulated or packed in at some the instrument to cut into the tissues elsewhere. arge.

Fig. 56.

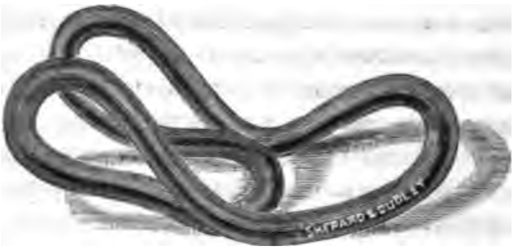


Block-tin pessary for procidentia.

procidentia, I have used a home-made instrument which has proved of great service in my hands. I have some block- from six to nine inches in diameter, which I first bend with rounded edges (A, Fig. 56). I next bend the side towards the middle, so that each of the three equal, as nearly as possible, in size (B, Fig. 56).

The instrument is then completed by bending over ends *a b c* together, and then flattening the instrument, if it be of large size, between the palms of the hands, so that it will be about one-third less in height than in width (C, Fig. 56). This instrument is intended, when not needed for a capacious vagina, to be of the same size and shape on all sides, as I have attempted to show in the portion of figure marked C. When made uniform in shape, the instrument can scarcely cut at any point, since pressure will cause it to roll over, or change its position. The openings should be large enough to permit a fold of tissue to enter on each side and meet in the centre. Since it is impossible for a very large fold to enter, the tissues cannot become strangulated. The vaginal tissue becomes literally buttoned into the instrument. Although the tissues are frequently changing their position, as well as the instrument, yet they never become disengaged from it, and when the proper shape has been given to the instrument, it can scarcely be forced out of the vagina. I have seen some of these instruments made of material so large in diameter as to be worthless, since the openings were thus left so small that the tissues could not enter in a fold sufficient to hold it in place. Different modifications of this instrument may be made useful. The end A may be opened and made longer than the other two portions, so as to enter the cul-de-sac, when support will be given to the uterus from behind and under each broad ligament. Instead of forming a triangle in the first instance, a larger ring may be used, making it square, and bending the four corners over and together as has been described for the triangle. One angle can then be opened to go into the posterior cul-de-sac, two in the middle left closed to support the anterior wall, and the remaining one bent back, and so shaped as to give support to any rectocele that may require it. For rectocele alone, I have sometimes employed another form when the support is taken from behind the symphysis. It is made by bending together an unusually long closed lever pessary, as in Fig. 57, so that more than half its length will reach just beyond the cervix, and the other, or shorter portion, will come across the posterior wall, about an inch or more from the vaginal outlet. Over this under blade, I frequently stretch an India-rubber band, or close it by a portion of thin sheet lead, such as is found in tea boxes. The portion which is to rest near the neck of the bladder must have a proper depression made, so as not to exert any pressure there, and the corners should be properly rounded off. When this instrument is well fitted, any downward pressure tilts the long lever up behind the pubes, and prolapse cannot take place, since the uterus is held from coming forward, and the cross-bar supports the rectocele. The material for these temporary instruments should always be block-tin, since this will admit of any necessary change of shape. When the pessary has been introduced, if of block-tin, two fingers can be inserted into the vagina, and the sides of the instrument may be spread apart at any point, or narrowed if necessary. Whenever the patient is beyond the reach of the personal observation or control of the physician, the prudent course would be to employ only the India-rubber disk, or the cotton support. As has been stated, the use of pessaries in these displacements requires constant observation, and in spite of all care, patients will sometimes suffer from their presence. Before removing a pessary or the cotton support, care should be taken to see that no portion of the tissues is engaged in, or adherent to it. If this is not done, the uterus will be dragged down to the outlet before it becomes freed, and consequently but little progress will have been made in relieving the prolapse. I always direct the patient, when removing it herself, to pass one finger on each side of the cotton dressing, so as to afford some support to the parts as this is withdrawn.

Fig. 57.

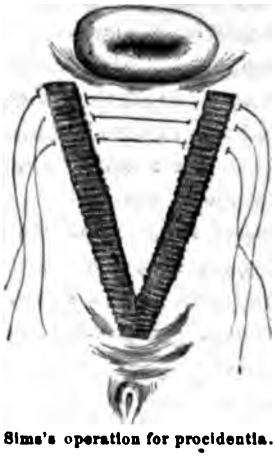


Long closed lever pessary for procidentia, in hard rubber.

Frequently some attention needs to be directed to the general condition, and it is always absolutely necessary to regulate most carefully the condition of the bowels.

The object of all surgical procedures looking to the cure of prolapse is to support the uterus in its proper place in the pelvis, until it has recovered its natural size. This is accomplished by turning in the excess of tissue, and uniting freshened surfaces which should be made to run nearly parallel on either or both walls of the vagina; after which the perineum should be properly restored so as to give suitable support at the vaginal outlet. By these operations, the vagina will be reduced to its original size and condition, without impairment of its natural capacity. Their object is simply to relieve the overstretched tissues from strain, that they may retract. This is done by taking in a plait, by which means the tissues thus turned in may regain their tone; in a few months all trace of the operation disappears. It is commonly held by the profession, that the object of the operation is to narrow the vagina, but this idea is erroneous and misleading. This canal can be easily shortened by uniting denuded surfaces transverse to its axis. But to narrow the vagina in its diameter after puberty to a greater degree than is normal in the virgin state, is impossible by any surgical procedure. This cannot take place except as a result of inflammatory action, accompanied by sloughing, and by contraction of the cicatricial tissue which takes place. If the denuded surfaces have been located too far apart, so much tension will result, when they are brought together, that the sutures will certainly cut out and leave the parts in their original condition. This is owing to the unyielding line along the vaginal sulcus on each side where the walls are connected with the pelvic fascia. This tissue, owing to its elasticity, can be stretched to a certain degree, but no suture can withstand its persistent traction, beyond a few days, without cutting out.

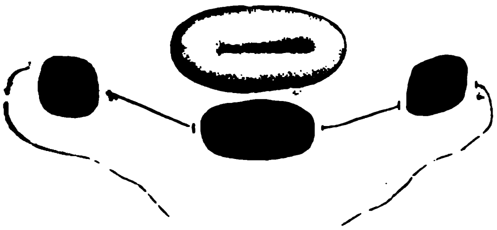
Fig. 58.



Sims's operation for procidentia.

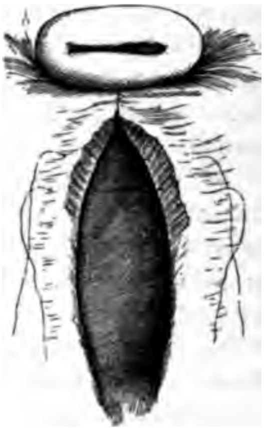
Marshall Hall many years ago suggested, but did not himself put the plan in practice, that for the relief of procidentia two denuded strips should be united running parallel on each side from near the cervix uteri to the vaginal outlet, thus making a double vagina, as it were. This operation, however, would always fail, as the anterior wall of the vagina would prolapse, and gradually press back the septum; or, by pressure, would excite absorption of the recently united surfaces until sufficient space is again produced for the escape of the uterus. Dr. Sims, in Feb. 1858, modified this suggestion: he commenced the denudation on the anterior wall of the vagina, near the neck of the bladder, making the freshened surfaces diverge from a common point, as shown in Fig. 58, and extend to each side of the cervix uteri, like the sides of a triangle. These surfaces were brought together and secured in the median line with interrupted silver sutures. In this way the neck of the uterus was crowded towards the posterior cul-de-placed on the left side for the introduction of the speculum. I then endeavor to find two points, one about half an inch from the cervix on each side and a little behind the line of its anterior lip, which can be drawn together in front of the uterus by means of a tenaculum in each hand. When two such points can be thus brought together without undue tension forming triangular-shaped folds, the surfaces are to be freshened. One of the tenacula must be securely hooked in the tissues, to indicate the point. Then, one hand being disengaged, a surface half an inch square about the point of the other tenaculum is to be denuded with a pair of scissors. Next a similar surface is to be freshened around the point of the first tenaculum, and a strip afterwards removed from the vaginal surface, in front of the uterus, about an inch long by half an inch wide (see Fig. 59). Having passed a needle, armed with a silk loop, beneath each of these freshened surfaces, as shown in Fig. 59, a silver wire is to be attached to the loop and secured by twisting, thus bringing together in front of the cervix, as will be seen in Fig. 60 these three points, with the effect of forming a fold similar to, but somewhat smaller than that formed by Dr. Sims's method. The chief advantages of this method, apart from its simplicity, are these: There is a loss of only a few drops of blood; and the neck of the uterus, at the beginning of the operation, can be secured in the cul-de-sac, and thus the hand of an assistant, which must necessarily be in the way, can be dispensed with. By the old operation, the tissues forming the folds were drawn from behind, and wrapped around in front of the cervix, while the chief support was from the column formed in the median line by turning in the redundant tissues below. By the method I have adopted, a direct lateral support is gained from the pelvic fascia, giving, in many cases, by this means

Fig. 59.



Author's operation for procidentia.

Fig. 60.



Folds formed after twisting the first suture.

alone, a sufficient support, entirely independent of the column to be afterwards formed from the tissues turned in along the anterior wall. The completion of the operation, after the cervix is thus fixed in position, is very simple. Fig. 60 shows the two folds on the anterior wall, in the shape of an ellipse, extending from the surfaces secured in front of the uterus nearly to the vaginal outlet. These are to be turned in by finding, with tenacula, from time to time, opposite points near the crest of each fold, which can be brought together without tension. With the object of preventing any unnecessary loss of blood, only half an inch on each side need be denuded at a time, one or more sutures being introduced and secured. Thus advancing step by step, the operation is completed by turning in these folds, until at length they become lost on the vaginal surface near the neck of the bladder. From four to five sutures should be inserted to the inch, passing first a silk loop to which the silver suture is to be attached for the purpose of drawing it through. The needle should be introduced so as to include a liberal amount of tissue, and the sutures twisted only just sufficiently to bring the raw surfaces in contact, that strangulation may be avoided from the swelling of the parts. The sutures are usually removed on the eighth to the tenth day. No special after-treatment is needed, beyond keeping a self-retaining sigmoid catheter in the bladder until the parts have become well united. When, from any cause, the catheter cannot be retained, the bladder should be emptied every few hours, so that the weight of a quantity of urine may not be borne by the recently united surfaces. If it be necessary to empty the bladder on a bed-pan, a little tepid water should be thrown into the vagina immediately afterwards, for fear that some urine may have passed in; by this method its effects on the uniting surfaces would be neutralized. It is absolutely necessary to confine the patient to the recumbent position for two or three weeks.

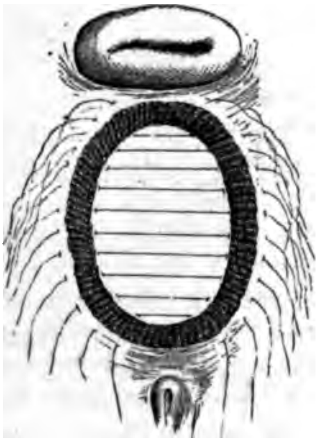
Where the upper portion of the vagina only has become dilated by an enlarged uterus resting on the floor of the pelvis, I often operate for the prolapse in preference to using a pessary. The operation, in principle, is essentially the same as that just described for the relief of procidentia. The line, however, formed by turning in of the superabundant tissue, only extends for a short distance on the anterior wall, since but a limited portion of the canal is dilated. Frequently, not more than two or three sutures are needed, but the line must be extended until a point has been reached where the folds [illegible] on a level with the vaginal surface. In other words, as only the upper portion of the vagina is dilated, there will be less and less tissue to turn in, and the folds will gradually become smaller towards the vaginal outlet until, at length, they will be lost or smoothed out, as it were.

When there is no laceration of the perineum, nor a dilatation of the vaginal outlet from rectocele, the operation described as applicable for the anterior wall may be of itself sufficient to cure a partial procidentia. If, however, the posterior portion of the canal has been involved, the uterus will gradually advance, and ultimately escape from the vagina. This it will do even after the operation has been performed successfully in every detail as described. Unless there exists a proper support below, no operation yet devised for the anterior wall of the vagina can, of itself, prevent a prolapse of the uterus. Under such circumstances, the sole purpose of an operation is to increase the radial distance between the cervix and neck of the bladder. Then, if the uterus cannot become retroverted, nor approach near to the symphysis, it will only prolapse in the circle incident to the radius thus gained. If the outlet of the vagina be sufficiently large, the procidentia may again become complete very soon after an operation. Yet, such an operation may have been a success, so far, at least, that the relative distance between the cervix uteri and the neck of the bladder, as gained by the operation, remained unchanged. As long as the radial distance between these two points is preserved, the base of the bladder will swing like a trap door, as if it were hinged under the pubes. It will advance with the uterus, as the latter is dragged down by the prolapsing posterior wall, to pass through the vaginal outlet as soon as this has become sufficiently dilated. This condition is commonly not appreciated, and the operative procedure is, in consequence, frequently condemned, and unjustly so. I will then repeat, that the prolapse may be relieved, in consequence of the increased radius gained by the operation between the cervix and the symphysis pubis, as a centre, provided the lower portion of the canal remains in a state of integrity. When such is not the case no permanent benefit will be obtained unless the perineum be closed and the rectocele removed, if necessary.

The operation on the posterior wall for rectocele, as formerly practised, resembled closely, in general principles, the one already described for procidentia. The denuded surfaces were made to extend from the fourchette upward, in the form of an ellipse, towards the cul-de-sac, and were continued until the excess of tissue was turned in level with the vaginal wall. The operation was a very difficult one to perform, from the want of space, and the venous hemorrhage was frequently excessive. Besides, it so often proved unsatisfactory, that I finally adopted a procedure by which the rectocele might be removed and the perineum closed by a single operation. This will be fully explained in connection with the operation for laceration of the perineum.

Cystocele is frequently met with in women advanced in life. An operation on the anterior wall is generally sufficient for its relief, without closing the perineum, although the loss of the perineum was the original cause of the difficulty. When, however, the procidentia does not become complete at the change of life, the prolapse of the anterior wall is not likely to be increased afterwards, as the then diminished size of the vagina affords the necessary support to it.

Fig. 61.



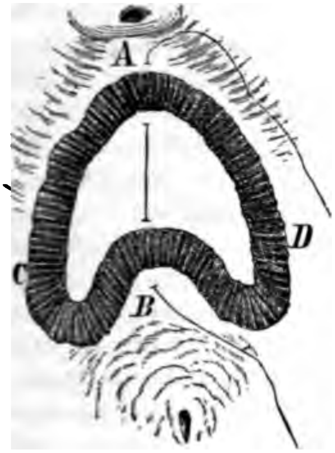
Sims's operation for cystocele.

For the relief of a simple cystocele, Dr. Sims's operation will be sufficient. This consists in the removal of a portion of the mucous membrane in the form of an ellipse, as shown in Fig. 61.

The patient is to be placed on the left side, and the speculum introduced. With a sound properly curved for two or three inches of its length, the excess of tissue can be pressed back in the median line towards the bladder, and thus held by an assistant. Two long folds will be formed, from which it will be necessary to remove, with a pair of scissors, small portions of tissue along their crest, to serve as guides for the entire ellipse. When the tissues are again allowed to roll out, it will be easy to connect these points, by removing the intervening strips of mucous membrane. These freshened surfaces are to be united by interrupted sutures along the median line, and secured in the usual manner.

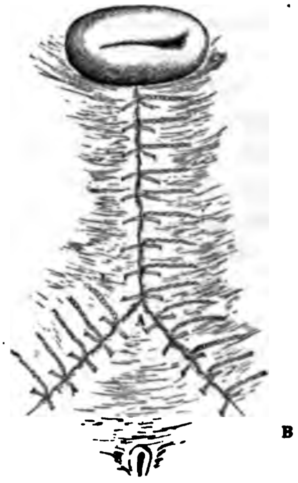
But, whenever the parts about the urethra have become prolapsed and thickened, constituting a urethrocele, this operation does not always answer. The difficulty is that it cannot remove this excess of tissue about the urethra, even if the line be extended to the meatus. Under these circumstances, I now remove the mucous membrane from the anterior vaginal surface in the form shown in Fig. 62. Only a single suture is represented as having been introduced, so as not to confuse the demonstration. When this suture passing through the apex of each triangle is secured, the two points AB will be drawn together, and at the same time the flap B will carry with it the excess of tissue about the neck of the bladder. This occurs on account of the uterus being the least yielding point. The sutures all radiate somewhat from the flap B (Fig. 62), and, when secured, the line of union forms the triangle CAD. After this operation the traction serves to correct the prolapse, and, as it is very great, the sutures should have been made to include a liberal amount of tissue, so that they may not cut out; and they should be allowed to remain in ten or twelve days.

Fig. 62.



Emmet's operation for cystocele, with urethrocele.

Fig. 63.



Position of the flaps after operation for procidentia with urethrocele.

For procidentia, with an excess of tissue prolapsing about the urethra, I adopt the same method, somewhat modified. About two-thirds of the distance, from the uterus forward, is united in a straight line as far as the point A (Fig. 63). The operation is then continued by removing the tissue about the urethra. It is necessary, as a first step, to ascertain by means of a tenaculum how much of the tissue can be drawn up in the form of a triangular flap to the point A. When the excess has been removed, and the point of this flap has been secured by a suture at A, two folds will be formed on each side extending towards the inner face of each ramus ischii. With a alone, a sufficient support, entirely independent of the column to be afterwards formed from the tissues turned in along the anterior wall. The completion of the operation, after the cervix is thus fixed in position, is very simple. Fig. 60 shows the two folds on the anterior wall, in the shape of an ellipse, extending from the surfaces secured in front of the uterus nearly to the vaginal outlet. These are to be turned in by finding, with tenacula, from time to time, opposite points near the crest of each fold, which can be brought together without tension. With the object of preventing any unnecessary loss of blood, only half an inch on each side need be denuded at a time, one or more sutures being introduced and secured. Thus advancing step by step, the operation is completed by turning in these folds, until at length they become lost on the vaginal surface near the neck of the bladder. From four to five sutures should be inserted to the inch, passing first a silk loop to which the silver suture is to be attached for the purpose of drawing it through. The needle should be introduced so as to include a liberal amount of tissue, and the sutures twisted only just sufficiently to bring the raw surfaces in contact, that strangulation may be avoided from the swelling of the parts. The sutures are usually removed on the eighth to the tenth day. No special after-treatment is needed, beyond keeping a self-retaining sigmoid catheter in the bladder until the parts have become well united. When, from any cause, the catheter cannot be retained, the bladder should be emptied every few hours, so that the weight of a quantity of urine may not be borne by the recently united surfaces. If it be necessary to empty the bladder on a bed-pan, a little tepid water should be thrown into the vagina immediately afterwards, for fear that some urine may have passed in; by this method its effects on the uniting surfaces would be neutralized. It is absolutely necessary to confine the patient to the recumbent position for two or three weeks.

Where the upper portion of the vagina only has become dilated by an enlarged uterus resting on the floor of the pelvis, I often operate for the prolapse in preference to using a pessary. The operation, in principle, is essentially the same as that just described for the relief of procidentia. The line, however, formed by turning in of the superabundant tissue, only extends for a short distance on the anterior wall, since but a limited portion of the canal is dilated. Frequently, not more than two or three sutures are needed, but the line must be extended until a point has been reached where the folds terminate on a level with the vaginal surface. In other words, as only the upper portion of the vagina is dilated, there will be less and less tissue to turn in, and the folds will gradually become smaller towards the vaginal outlet until, at length, they will be lost or smoothed out, as it were.

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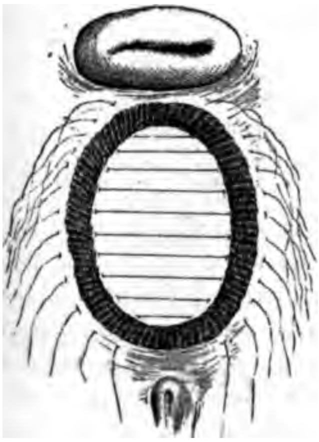

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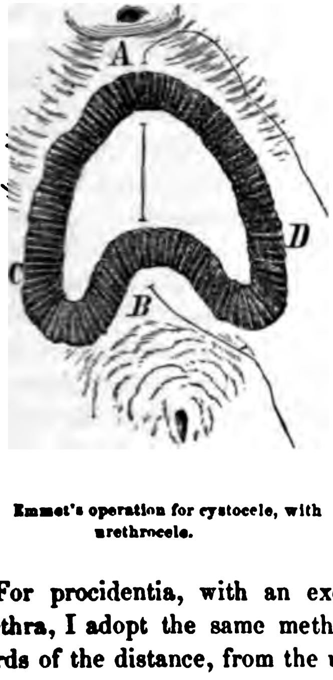
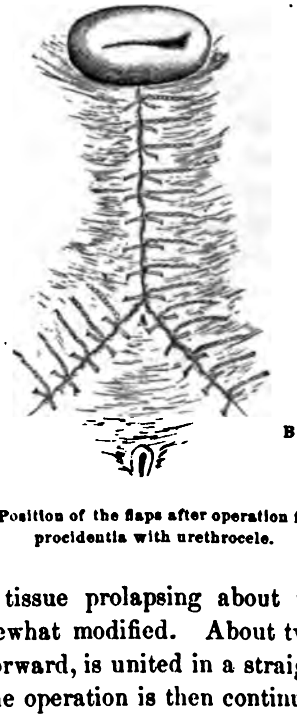


Emmet's operation for cystocele, with urethrocele.

Fig. 63.



Position of the flaps after operation for procidentia with urethrocele.

For procidentia, with an excess of tissue prolapsing about the urethra, I adopt the same method, somewhat modified. About two-thirds of the distance, from the uterus forward, is united in a straight line as far as the point A (Fig. 63). The operation is then continued by removing the tissue about the urethra. It is necessary, as a first step, to ascertain by means of a tenaculum how much of the tissue can be drawn up in the form of a triangular flap to the point A. When the excess has been removed, and the point of this flap has been secured by a suture at A, two folds will be formed on each side extending towards the inner face of each ramus ischii. With a tenaculum in each hand, we are to judge how much tissue should be turned in. Then, when the additional denudation is completed and the sutures have all been twisted, there will be formed the lines AB and AC, as shown in Fig. 63. This plan of operating disposes most effectually of all excess of tissue, and, when union has been obtained, the support is perfect, since it is exerted in all directions. But with all of its advantages, one difficulty remains which I have never been able to overcome. In consequence of the traction exerted in opposite directions, the three flaps brought together almost always separate to some extent at the angle A after the sutures have been removed, and this necessitates a second operation.

CHAPTER XX.

LACERATION OF THE PERINEUM.

Effects of laceration—Mode of operating—Jenks's method—Introduction of the sutures and securing the wires—Laceration through the sphincter—Mode of operating—Causes of failure—Table XXXII., showing relation of laceration through the sphincter to age, pregnancies, labors, etc.

THE importance of having the perineum intact, and its influence on the condition of the nervous system, has not hitherto received that appreciation which it merits.

When it is extensively lacerated and a prolapse occurs, it is easy to recognize that there is an obvious cause of suffering. But we meet with cases complicated by nervous disturbances, due, as experience teaches us, to the existence of this lesion, without prolapse. That this is so there can be no doubt, although we may not be able to offer any satisfactory explanation of it. A laceration of the perineum is sometimes accompanied by a general irritability, which cannot be traced to any other cause, and is only relieved when it is restored. I have known of several instances in which the existence of scars on the perineum had so much effect upon the nervous system as to entirely change the disposition of the women; and yet they were not conscious of any local difficulty.

The perineum is liberally supplied with bloodvessels and nerves, including branches from the sympathetic system, which are so freely distributed to the neighboring erectile tissues. The presence of sympathetic nerves offers an explanation of the reflex irritation so often produced, by the cicatricial tissue in the perineum. That reflex irritation does emanate from the perineum, as the effect of a local exciting cause, cannot be questioned. It is a well-known fact that contractions of the uterus can be excited, during the progress of a labor, by pressure on, or by stretching back, the perineum. Whenever a laceration has been extensive, so that after healing there is a dense cicatricial surface left, the most profound degree of anæsthesia can scarcely allay the irritation excited by the traction necessarily produced in using Sims's speculum. I have been obliged to defer an attachment of the ischio-perineal ligaments, with the effect of leaving the vaginal outlet flaccid and depriving it of its proper support.

The great discomfort which is experienced sometimes even before any prolapse has been detected, must be due to over-distension of the bloodvessels, the coats of which are no longer properly supported, and their increased pressure on nerve-fibres. This is a condition in itself likely to prove an important factor in displacing the uterus by adding to its weight, and by exciting tenesmus.

Whenever the perineum has been lacerated so that the proper degree of support to the vaginal walls is no longer exerted, there can be no doubt as to the necessity for an operation to restore the parts to their original condition. There are cases, however, where a doubt as to this necessity may remain even after a careful examination. After the occurrence of the accident, and if the vagina, as has been described, becomes a patulous canal, the air will enter into, and be displaced from, the passage with every movement of the body. In case of doubt as to the propriety of an operation I question the patient in regard to this circumstance, and always operate when I learn that, on suddenly turning in bed, or on making any quick movement, the patient observed the air to escape from the vagina, like flatus from the anus.

I have already described at length, that the restoration of the perineum is essential to the cure of all cases of prolapse, and that no surgical procedure or mechanical resource will prove of permanent benefit as long as any degree of rectocele exists.

In my practice I have found it necessary to close the perineum for one hundred and fifty-four women of the number who suffered from the different degrees of procidentia. To impress this fact I will state that, of one hundred and eighty women having rectocele, cystocele, or complete procidentia, I closed the perineum (in addition to other operations) in all but twenty-six cases. Where the operation was deemed unnecessary, it was found to be almost entirely among those who had cystocele only, and in whom a change of life had already taken place previous to the operation.

For over twenty years I have been in a position to observe the value of each surgical procedure devised for the relief of these difficulties, and to appreciate the changes brought about by time—the most valuable test of all. This experience has taught me that whenever the procidentia has been complete, the displacement recurred, I believe, in every instance when the perineum had not been closed, unless a change of life had already taken place. In all the cases under my observation, the longest interval before the recurrence of the procidentia, and where the support of the perineum was wanting, was about four years. I found that, even after carefully closing the perineum, as the final operation, the procidentia would soon return if the uterus was left retroverted, unless it so happened that the organ had become bound down by adhesions. I observed also that after the old method of operating for rectocele a new condition, to be again referred to, was left, which frequently reproduced the procidentia, by bringing about absorption of the perineum; and this led me to adopt the operation which I will describe further on.

MODE OF OPERATING FOR LACERATION OF THE PERINEUM.

The mode of operating, as practised by Baker Brown and those who preceded him, was of no value for giving support to the vaginal walls, since it effected only a union of the sides of the labia; it did not re-establish even indirectly, the connection between the vagina and the fascia and deep tissues of the pelvis. Consequently, the soft parts, which were thus brought together, soon became stretched and thinned out, by the pressure from above, and left the vaginal outlet as patulous as before. The quill and silk suture was in general use; it was deemed necessary to divide the sphincter ani muscle; and lateral incisions were often made into the soft parts to relieve the tension. It was impossible always to distribute evenly the tension along the quill, and sloughing and erysipelas frequently occurred. The use of silk in this vascular tissue more frequently caused abscess than is now found to be the case when the metallic suture is used. Moreover, the division of the sphincter, and the incisions made into the soft parts, complicate the after-treatment exceedingly and, as experience has taught, were wholly unnecessary.

Dr. J. B. Mettauer,[1] of Virginia, was, I believe, the first on record who employed metallic interrupted sutures in this operation; he used them with success as early as 1830. He somewhat modified the application of the leaden ligatures of Dieffenbach, and, I believe, did not divide the soft parts. Dr. Sims substituted the silver wire for the leaden wire of Mettauer in this operation, and this was certainly a great advance. He did not divide the sphincter, or think it necessary to make incisions to relieve the tension on the sutures, but in no other respect did his mode of operating differ from that generally practised.

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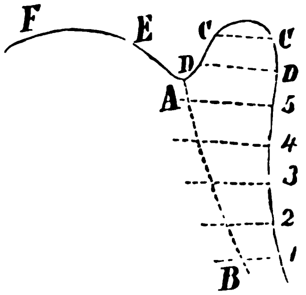
[1] Amer. Journ. of Med. Sciences, Philadelphia, 1833.

On taking charge of the Woman's Hospital, in the autumn of 1862, I began a series of observations in regard to this operation, but more particularly with reference to the best mode of procedure when the sphincter ani is involved, and reached the conclusion that to secure the proper amount of support it is necessary to include a certain portion of the vaginal tissue. From that time until the spring of 1875, I included the posterior wall of the vagina to the level of the sulcus, in all the sutures, with the exception of the uppermost two, which were used simply to bring together the sides of the labia. I have since then included a portion of the vaginal tissue in all the sutures. Previous to the spring of 1875, it had been my practice to employ a special operation for the relief of the rectocele. The excess of tissue was turned in along the median line, and secured by interrupted sutures until the vaginal outlet was reached, when the perineum was closed up to the terminal point of the previous operation. If the one operation followed the other, several of the perineal sutures were passed in the space between as many of the lower sutures used for closing the rectocele. But the prolapsing recto-vaginal septum could never be entirely disposed of by this method, for a more or less convex vaginal surface would always remain after the operation. In the diagram, Fig. 64, the dotted line *A B* represents the portion of the posterior vaginal wall which was brought up behind the closed perineum by the sutures 1, 2, 3, 4, and 5, while the dotted lines *C* and *D* mark the direction of the two sutures which were passed only through from one labium to the other. The result of this operation was only of temporary benefit, a triangular hollow space was always left at *E*, just behind the new perineum, which soon became filled by a fold from above, and this portion prolapsed as far as the barrier formed by the labia would permit; and as soon as one portion came down, its place would be at once occupied by the tissue just behind it, so that the vaginal column became gradually weakened. The perineum became overstretched, and the original condition of rectocele or procidentia was in time, as a rule, gradually reproduced. The convex surface remaining on the recto-vaginal septum after this operation is a great source of

Fig. 64.

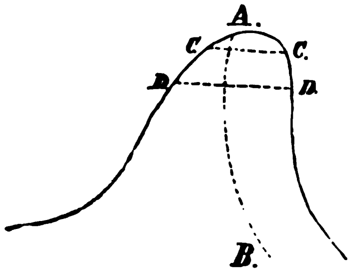


weakness. As a consequence of any downward pressure, this curve becomes increased, so as to bring the full force to bear against the newly-formed perineum. It is then but a question of time for its absorption to take place, and for the original condition to be reproduced.

If we were to catch up with a tenaculum a portion of a cloth table cover, and make traction upon it, several folds would be formed. These folds would radiate off on each side from the instrument to any point where the cover was secured along the edge of the table, or to where a certain amount of friction had to be overcome. Now, in a case of rectocele, the tissues can be caught up in the same manner, and drawn towards the vaginal outlet, the amount of prolapse can be accurately appreciated, unless the procidentia has been complete, so that the integrity of the whole posterior wall is impaired. It would, of course, be easy to draw down the whole posterior wall by exercising a sufficient amount of force, but we must not go so far as that.

The crest of the rectocele, at *F*, Fig. 64, represents the limit of the prolapse, and the septum above that point possesses yet sufficient integrity to remain in position when free from any drag below. This will likely be the case so long as the cellular tissue with which it is closely connected has not been overstretched. When this crest is drawn down to the vaginal outlet, we can trace with the finger the folds extending obliquely into the sulcus on each side, and we may judge by the yielding of the tissues as to the extent of the prolapse; and by passing the finger up to the uterus, we can ascertain whether this organ is involved in the displacement.

Fig. 65.



In the operation the mucous membrane must be removed from the whole surface, extending from the vaginal outlet to the crest of the rectocele. The uppermost suture *C*, Fig. 65, which formerly was made to include only the tissues of the labia, must now be made to catch up the posterior vaginal wall at *F*, Fig. 64, so as to draw it down and obliterate the sulcus which was always left at *E*. After all the sutures have been secured, the line of union *A B*, Fig. 65, will show the direction in which the excess of tissue forming the rectocele was folded in. The effect is to change entirely the shape of the vaginal wall, so that as the finger enters the canal it will pass at once along a concave surface. By this operation, the vaginal wall will have been restored to its original shape and size, and the perineum will be firm and directly supported by the fascia and connective tissue of the pelvis. As the posterior vaginal surface is now concave, any downward force exerted against the perineum would only increase the concavity, and be expended over the floor of the pelvis. When only the proper amount of tissue has been turned in by the operation, this curved line which is formed may be compared to the sloping surface of the upper side of a dam which the engineer has thrown across a stream. If a simple wall were built, the whole force and weight of the volume of water would be concentrated against a point near the centre of the dam, which would first bow outwards, or bulge, before being swept away. But, if the engineer possesses a knowledge of the volume of water, which is to pass in a given time, and also its velocity, he will so shape this bank of earth, at the proper angle, that the force of the stream will be distributed equally along its surface, and the dam will be secure.

For the operation, the patient is to be placed on a narrow table, on the back, with the legs drawn up, and the ether be administered. But before commencing the operation, the night-dress and flannel must be drawn up to the waist, so that they may not become soiled. It will be necessary to place a sponge or a folded towel in the region of the coccyx to collect the blood which will run down between the buttocks. When the anæsthetic is complete, both legs must be flexed on the abdomen, and held by an assistant after the body of the patient has been drawn down to the edge of the table. An assistant must stand facing the operator on each side of the table. Such a position will enable each assistant to secure one of the patient's legs by passing his arm over the limb as it is flexed. This will leave the hands disengaged, and the nearest one can be employed to keep the labium on that side retracted. In separating the labia, the fingers of one assistant must be placed directly opposite those of the other; for if they are not on the same line, or if unequal traction be made, it will be difficult to avoid denuding the side of one labium higher than that of the other.

We may commence the operation by removing the mucous membrane from any point, but it is best to do so at the most dependent portion, advancing from below upwards, and thus avoiding the flow of blood over the surface to be removed. The mucous membrane is caught up on the point of a tenaculum, and with a pair of properly curved scissors, it should be removed in a horizontal strip running from side to side. If the operator is ambidextrous the whole surface may be removed in one continuous strip. By using a pair of scissors with a different curve to turn the point at one labium, we can extend the line back again upon the posterior wall of the vagina, from there to the opposite labium, and then over the same course again, a little higher each time. The first step in the operation should be to determine, by the method already described, the extent to which the denudation is to be carried on the posterior wall. This point we mark by removing a small portion of tissue from the median line. The advantage of the scissors in this operation cannot be questioned, for, with the utmost dexterity and quickness, the parts cannot be freshened and brought together without a great loss of blood, and the amount of bleeding is less from the scissors than from the knife; and with the scissors the denudation is more rapid.

Prof. Edwd. W. Jenks, formerly of Detroit, but now of Chicago, has recently published[1] a method by which he obtains a denuded surface with but little loss of blood.

"The patient being etherized, I begin by nicking with scissors the anterior margin of the surface to be denuded, at the juncture of integument and mucous membrane; next, I introduce two fingers of the left hand into the rectum; while assistants hold the labia apart, it being important that they are held uniformly tense. I use scissors slightly curved and sharp pointed. to denude the mucous membrane. I use neither tenacula nor tissue forceps, but, with the parts tense, snip a hole in the mucous membrane in the median line, close to the integument, and then inserting the scissors with a cutting motion into the small hole made, I continue to dissect the mucous membrane away from the subjacent tissues without removing the scissors, first going up the septum as far as is desired, and then laterally, first on one side, and then on the other, without removing the scissors or once bringing their points out from beneath the mucous membrane; then with blunt-pointed scissors cut away the dissected flaps. The bared surface thus exposed is much the shape of a right-angled triangle, with the base directed outward, or it has been compared in shape to a butterfly, with wings spread and tail directed upward.

"The advantages of this mode of denuding are, (*a*) the rapidity with which it can be done; (*b*) the absence of hemorrhage in the vagina, as no blood escapes except at the locality where the scissors enter beneath the mucous membrane; (*c*) the ability by which the operator can make complete denudation, as the discoloration beneath the membrane marks the route the scissors have taken."

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[1] Perineorrhaphy, with special reference to its benefits in slight lacerations, and a description of a new mode of operating. (Am. Jour. of Obstetrics, etc., April, 1879.)

Dr. Jenks describes, and gives a drawing of "a dart-shaped thin blade with double cutting edges," devised by Dr. Albert H. Smith, of Philadelphia, for this operation.

Notwithstanding my partiality for the use of scissors, I believe this knife would answer better for the purpose.

Dr. T. G. Thomas has informed me that he first operated by this method as early as 1869, in the Stranger's Hospital of this city, and with an instrument on the principle of a glove stretcher which he devised for the purpose. His operations, however, were confined to the anterior wall of the vagina.

But Dr. Janvrin has stated to me that as early as 1872, he assisted the late Dr. Peaslee in operations on both walls, where the tissues were separated in the manner described.

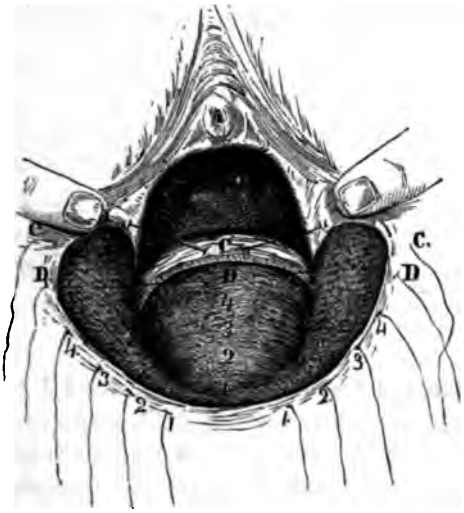
Dr. Jenks's name will necessarily be connected with the operation, from the fact that he has first described and placed the method on record.

I always use a thick, straight, sewing needle, from an inch and a half to two inches in length, with a large eye, carrying a silk loop to which the wire is to be afterwards attached before being drawn through. I adopted the straight needle after having devoted much time and thought in attempting to perfect some better means than that in common use. If the curved needle with a handle be used, it is first passed through the tissues, and then the loop of thread is introduced into the eye at its point, and pulled through as the needle is withdrawn. The handle gives great control in directing the course of the instrument, so that it is readily introduced. I have also used hollow needles of different curves, having a handle, and equally well under control. But the one great objection to all of these instruments is the large size which is necessary to secure for them the requisite rigidity. If they were not rigid and unbending, it would be impossible, even with the aid of the handle, to direct their course with accuracy. The tissues through which they are to be introduced are exceedingly vascular, so that a thrombus may readily form, and this generally terminates in an abscess. To avoid this difficulty—which is not a theoretical one—it is necessary to discard any instrument which has a flat cutting edge at its point; and the diameter of the instrument should be reduced as much as possible, so that it may correspond somewhat closely to that of the suture. A straight needle, which acts like a wedge, and has its widest diameter near the eye, alone presents these advantages. Such a needle simply separates the tissues, without cutting them, and the silver wire suture when introduced fills up the tract. A needle with a curve near the point would possess some advantages at its exit from the tissues, but a curved needle will roll in the grasp of the forceps, so that its course cannot be directed with any certainty, and in order to secure the necessary strength it must be made greater in diameter than if it were straight.

The introduction of a straight needle through a semicircular course may seem difficult, but such is not the case, as the soft parts are so yielding. The index finger must be passed into the rectum to appreciate the course and facilitate the passage of the needle, and, at the same time, it will protect the posterior wall of the bowel from becoming transfixed. As the tissues of the recto-vaginal septum are thus lifted up on the point of the finger the course to be followed by the needle becomes nearly straight. If we introduce the needle into the left labium it is made to sweep in a curved line, with its point to the right, by pressing the jaws of the forceps into the soft parts just in proportion as the needle is advanced in its course. Then, when the median line has been passed by the point of the needle, its course is directed towards the point of exit by gradually rotating the hand to the left. As the point of the needle approaches the skin its exit can be directed, and the necessary counter-pressure be made by the thumb-nail alongside of the finger in the rectum. As soon as the point of the needle has been sufficiently cleared by pressing back the tissues with the nail it can be seized by the forceps and drawn through. The only special dexterity required in the passage of the needle is to properly rotate the forceps and wrist until the course of the point can be directed by the thumb-nail of the other hand. The natural impulse is to overcome the resistance of the tissues, and to sweep the needle through the curved course by twisting it in the grasp of the forceps. The consequence is that the needle is usually broken just beyond the grasp of the forceps, and the portion already imbedded is often extracted with great difficulty. It is well to introduce the wire as soon as the loop of thread has been drawn through, since the oozing will occasionally be troublesome if we allow the silk to remain in the tissues for some time before removing it.

We may now briefly review the steps of the operation, by reference to the accompanying Fig. 66. The letter C is placed at the crest of the rectocele, in the same position as represented in the two preceding diagrams. It is shown that the surface has been denuded from the edge of the sphincter ani muscle up each labium to the remains of the carunculæ, and across on the posterior wall of the vagina to the crest of the rectocele. Suture 1 is introduced nearest to the edge of the anus, and its course through the recto-vaginal septum is indicated by dots. The same explanation in regard to their course is applicable to the other numbered sutures. The course of the suture D is shown on its exit from behind one labium to enter at D in the median line near the upper edge of the denuded surface of the posterior wall of the vagina. This is essentially the last suture introduced to secure this surface, and does not include more than an inch of the septum before it passes to the opposite labium. The course of the uppermost suture C is through the labium just in line with the limit of the freshened surface. It is then made to catch up a small portion of the vaginal tissue at C, beyond the denuded surface of the recto-vaginal wall, when it passes to the opposite labium. Experience has demonstrated the advantage of going beyond the limits of the denudation and of including only the central portion of the posterior vaginal wall in this last suture. Formerly, when the last suture was at D, along the upper edge of the denuded surface, and the parts were then brought together, the union was seldom complete. The edges were frequently pulled apart either by a careless introduction of the catheter, by movement of the limbs, or by a certain amount of dragging backward

Fig. 66.



Operation for lacerated perineum.

from the weight of the posterior wall of the vagina. It was difficult moreover to protect the parts from the urine which would sometimes force its way in behind the flaps and prevent union. It is, therefore, intended that the suture C should draw a portion of the vaginal tissue sufficiently forward to protect the edges, which have been approximated by the preceding suture D. At the same time the suture C plays even a more important part, since, by including the tissue beyond, it sustains all the traction until the denuded surfaces have had time to become firmly united.

The labia having convex surfaces, it is not possible to give by a diagram the extent of tissue freshened on their posterior face. The outline of the denudation may be roughly compared to the figure of a trefoil. The cusps A and B, Fig. 67, are supposed to represent the freshened surfaces of the labia. The figures 1 1 represent the external portions of the labial cusps, and 2 3 respectively their internal or vaginal portions. The cusp C represents the freshened surface of the recto-vaginal septum, and is like the others numbered in two portions 2 and 3. When the parts are drawn together, portions 1 1 of the labial cusps lie in apposition; and portions 2 and 3 of the labial cusps are applied respectively to the corresponding portions 2 and 3 of the vaginal cusp. Diagram, Fig. 68, represents the parts just as they are being brought into contact, and may demonstrate in a clear manner the condition. A B and C are the points brought together, the figures 1 1, 2 2, and 3 3 correspond in position to same given in the preceding diagram. A 1 and B 1 show the thickness of the labia, and C the crest of the rectocele, drawn down to the labia and acting like a bank of earth behind the mill-dam, as has been described.

Fig. 67.

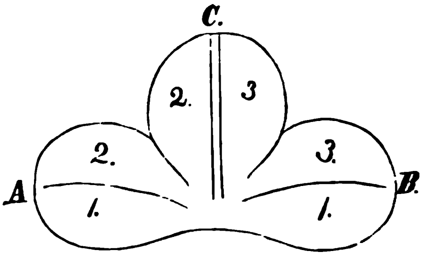
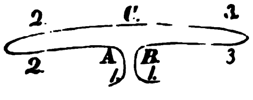
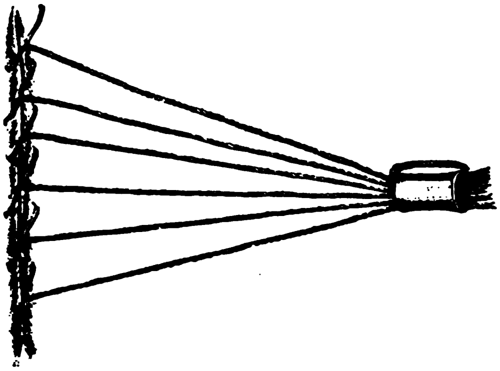


Fig. 68.



I have never found any necessity for using more than the one set of sutures and these should be passed deep enough to include a liberal amount of tissue. If these are properly introduced, and at regular intervals, superficial sutures will be superfluous. It is better to have the silver wire for this operation a size or two larger than that in general use, to afford a greater amount of support to the parts. I leave each twisted suture about three inches in length, and when the operation has been completed, I secure the ends of all of these together, like the radial sticks of an open fan. These ends may be bound together by slipping over them a short section of rubber tubing (see Fig. 69), and then bending back the end of one of the sutures to keep it in place, or they may be wrapped by a short piece of wire with a little cotton over the ends. By adopting this plan there is less risk of labial abscesses or accidental irritation of any individual suture.

Fig. 69.



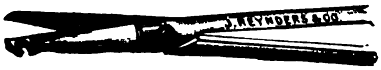
Method of securing the ends of the sutures.

After Treatment.—The patient must be kept in bed with her knees tied together and a soft pad between them. The urine should be drawn with care, to prevent it from running over the healing surfaces. This can best be done by flexing the legs over the abdomen, as at the time of the operation, and without removing the bandage from the knees. As the catheter is withdrawn, the index finger covered with a piece of soft muslin or linen should be held beneath the urethra to catch the urine which would drip upon the wound. Precaution should also be taken to close the end of the instrument by keeping the finger over it. A difference of opinion exists as to the necessity for using the catheter, and in regard to the deleterious effects from urine running over healing surfaces. I have been very anxious to dispense with the use of the catheter if possible, but I have certainly gotten the best results when I have employed it; so that notwithstanding all of its disadvantages I must advocate its use whenever it is not absolutely contraindicated. The mere passage of fresh urine over a wound is not in itself a source of irritation, but it becomes so when stale, and when its salts are deposited on the healing surface. If the parts could be properly cleansed after the urine had been passed into a bed-pan, the use of the catheter might be dispensed with. But we cannot prevent a certain amount of urine from passing back into the vagina, and it is even likely to find its way between the tissues which have been brought together. But should the urethra become irritable, or anything else occur to render inadmissible the use of the catheter, it will be necessary to observe more than the usual cleanliness, and whenever the bladder has been emptied, and before removing the bed-pan, the nurse should throw a pint or more of tepid water into the vagina. The nozzle of the syringe should be carefully introduced close to the urethra, and be held in this position so as not to come in contact with the line of union. The parts can be greatly protected by the liberal use of vaseline or some simple ointment of a consistency which will permit it to remain on the surface. This may be applied not only over the labia, but along the line of union, and in the vagina, which is the part most exposed to the action of the urine. The free application of the vaseline or cold cream over the labia will add greatly to the comfort of the patient by lowering the temperature of the parts, and it should be used even if not needed to protect them. As the bowels can be moved without materially disturbing the line of union, nature may be allowed to take its course if the demand be made, but the diet had better be regulated, if possible, to constipate the bowels for five or six days. Opium should not be used in any form, unless the necessity be very great, and even then it is well to seek some substitute for it. The position of the patient may be changed from the back to either side without injury to the sutures, so long as the thighs are kept together. I direct the patient, beforehand, to draw the limbs well up, and then have her rolled over on to the side by lifting up the mattress with one hand at the level of the shoulder, and with the other at the hips. By this simple plan a patient can be moved with very little disturbance. If it be wished to change the position without turning her completely on the side, a bolster or several pillows may be placed under the mattress, so as to support the body of the patient at any angle. The parts will have become sufficiently healed by the seventh day for the removal of the sutures. No advantage is to be gained by leaving them for a longer time, but on the contrary, there will be risk of some accidental injury and inflammation. To remove the sutures, it will be necessary to place the patient on a table, and on her back, with the feet drawn up. As it would not be advisable to separate the parts to bring the loops into view, it will be necessary to trust somewhat to the sense of touch. We are first to remove the piece of tubing by cutting through the mass of sutures, which will free their ends. Then the lowest one may be grasped by a pair of forceps and gently turned to the right side, while the blades of a pair of sharp-pointed scissors are passed down along the left side of the suture in search of the loop. We endeavor to get the loop between the points of the scissors, close to the twisted portion, and we can generally feel certain when this portion is within grasp. It would be very awkward to cut the twisted portion away, leaving the loop imbedded in the tissues, to cause irritation and annoyance afterwards. We cannot always be certain that we have only caught up the loop, but, as a rule, when the points of the scissors are gently closed, we are able to appreciate, by the degree of resistance, between the single strand of wire and the twisted portion of double thickness. When the loop has been cut, the suture must be withdrawn from the tissues in a manner to cause as little irritation as possible, and without pulling apart the recently united surfaces. If drawn out across the labium to the same side on which the loop has been cut, it will continue to bind the parts together until its exit. The parts can also be supported and protected by an assistant pressing or holding the labia together until all the sutures have been withdrawn.

It is exceedingly difficult to remove these sutures when buried as they always are in the swollen tissues, without giving great pain or pulling open the parts. With all due care the twisted portion of the suture may be cut off, leaving the loop in the tissues to cause irritation afterwards, and sometimes separation of the parts in the attempt to find the lost portion of the suture.

Dr. Bache Emmet has recently overcome this difficulty by a very simple device.

Fig. 70.



Bache Emmet's wire nippers.

Fig. 70 represents a pair of scissors or nippers with a groove near the point of the lower limb, which is made of a proper size and deep enough to allow of the easy passage of the wire. To use the instrument properly the end of the twisted suture should be seized with a pair of forceps, and the groove of the instrument engaged on the wire while holding the nippers in such a manner that the grooved canal will be horizontal with the suture and run freely. By slipping it along the twisted portion of the suture as far as it can go, the wire may be clipped with the certainty that only a portion of the loop can be brought within grasp of the nippers.

For a week after the removal of the sutures, the limbs should remain bound together, then the bandage may be thrown aside, and only used at night for a few days longer. As a rule the patient should not be allowed to assume the upright position for two weeks, and, if the general health is not likely to suffer in consequence of a continued confinement, the additional rest of another week will be of advantage.

As the patient gradually returns to her usual occupation her condition must be closely watched. If the slightest tendency to retroversion is detected the position of the uterus must be corrected, and a pessary fitted to correspond to the altered condition of the vagina. If this precaution is neglected, and the uterus become retroverted, it will simply be a question of time before all will be lost and the original condition reproduced.

Laceration through the Sphincter Ani, and the Mode of Operating for its Relief.—Consideration of this subject naturally follows that of laceration of the perineum, since it is but an extension of the same injury. It is not, however, necessarily connected with the study of procidentia, since a woman with a torn sphincter generally seeks advice early, and the injury is repaired before sufficient time has elapsed for the case to become thus complicated. Laceration of the perineum and that of the sphincter ani are but different degrees of the same injury: and both require the same operation also, varying only in detail. Therefore, even if the connection of a common cause did not exist, it would be essential to consider the modes of treatment together in order to avoid repetition.

Etiology.—In the accompanying Table XXXII., the record is given of fifty-three cases of complete laceration through the sphincter ani. These were treated in my private hospital, but constitute only a part of the total, as there were other cases of which the records were so incomplete, that they could not be utilized.

That the table should be readily understood, the reader must be informed that of the 53 cases treated, but 44 were able to give the time of puberty, and but 45 that of marriage. Also that the averages just below these numbers are taken upon these, and not upon the total number of cases treated.

TABLE XXXII.—*Lacerations through the Sphincter Ani.*

	Age at the time of			Number of pregnancies.					Length of time since receiving the injury.	Total number of years and average since last pregnancy.	Change of life.		Age at the time of injury.	Average labor by which the injury was received.	Character of the labor when injured.							
				Before		After																
	Admission.	Puberty.	Marriage.	Children.	Miscarriages.	Children.	Miscarriages.	Total number of pregnancies and average number of children.			Number and age.	Time in months and average in years.			Not stated.	Rapid.	Tedious.	Forceps.	Turning.	Craniotomy.	Twins.	Large children.
Private Hospital— Number............	53	44	45	53	8	11	7	128	53	135	2	87	51	53	8	3	4	33	2	1	2	13
Average	31.15	14.18	23.40	1.75	1.12	1.54	1.28	2.41	4.05	2.43	45.50	3.50	27.01	1.73								

The first feature presented by the table is the early age of those who had sustained this injury several years before applying for relief. This fact is of more particular interest in comparison with the average age of those who suffered from the different stages of procidentia.

The average age of puberty is essentially the same as that found to be the general average for the women of the better classes.

The time of marriage is fully two years later than the average for those who suffered from cystocele or complete procidentia, while it is almost the same as that found for those with rectocele, who were treated in my private hospital. The average age at the time of marriage being also so much beyond the general average on all women, it is but natural to infer that this injury has some connection with marriage contracted late in life. Yet, on the other hand, but thirty-two per cent. of the total number, who suffered from laceration through the sphincter muscle, were found to have married after the age of twenty-five years.

The proportionate number of children borne by those who suffered from this injury, is about half that credited to those who had procidentia in after life, and the proportion is about the same if the average be taken before the operation, or upon the total number.

The average length of time since the reception of the injury, and that since the birth of the last child, is much less than was the case with procidentia. Yet the condition, as would naturally be supposed, does not seem to have been so great a bar to impregnation as the different stages of prolapse. The average age at the time of receiving the injury was twenty-seven years, being just five years earlier than the average for those who suffered from procidentia in its different stages. The proportion who were injured in their first labor was 77.35 per cent.

In regard to the method of delivering, thirty-three cases, or 62.11 per cent., were delivered by means of the forceps. This proportion was taken on the total number, which included four cases where the condition of labor was not given. The proportion of unusually large children was greater than usual, and in every instance they were delivered by forceps. Craniotomy was performed in one instance, when the pelvis was very much contracted. Eighteen cases only of laceration of the cervix were noted, a number, I am satisfied, which future observation will show to be below the usual proportion.

Operation.—During the autumn of 1862, and in the following year, I investigated the use of the rectal tube. This instrument, which was about equal in size to a No. 12 bougie, had been employed by Dr.

Sims with the view of allowing free vent to the escape of flatus. Whenever the operation failed, leaving a recto-vaginal opening just behind the sphincter ani, it was generally attributed to stoppage of the tube with feces, while occasionally, it was suspected that the nurse, through carelessness, would force the tube into the vagina between the sutures. As I made myself familiar with the details, I became more and more skeptical as to the necessity for the rectal tube, since it was almost impossible ever to keep it free. I began my experiments by substituting a short section of a solid rod the size of the tube. This was tied in and allowed to remain undisturbed for several days; the operation for the laceration proved a success. I increased the size of the rod and succeeded in several more cases; but when the diameter exceeded that of the little finger, irritation was excited, and the operation failed. I next used a section of a copper sound, which was somewhat less than half the diameter of the original rectal tube. This small foreign body proved a great source of irritation, and the operation failed. For several years I was at a loss for an explanation, beyond the supposition that the tube relaxed the sphincter, yet experience soon taught, as I have stated, that there was a limit beyond which any increase in size caused irritation. I concluded to use neither tube nor plug, and continued to operate until about the beginning of 1870 with varied success, unable, however, to offer an explanation for the success at one time and failure at another. In a large number of cases, not a fibre of the muscle was united, although the perineum may have been restored, and the laceration through the recto-vaginal septum closed by the operation. To unravel the cause of failure, and to devise the means of obviating it, occupied my attention for years. To appreciate so simple a condition, as I shall explain, cost me more thought than I have ever devoted to any other professional subject.

Early in 1873, I published[1] an account of the cause of failure, and a new mode of operation, and I have now but little to add as the result of further experience.

When the perineum and the muscular ring forming the sphincter ani have been lacerated, a gaping triangular opening is left. The base of this opening is formed by the lacerated muscle, and the apex by the limit of the laceration through the recto-vaginal septum. For the convenience of demonstration, I will describe the shape of the divided muscle. Gradually the fibres which formed the inner surface of the circle, when the muscle was in its integrity, will have shortened more than those on the outer margin which remain attached to the neighboring tissues, because muscular fibres always retract when they have been freed from their attachments. A glance at the diagram, Fig. 71, will show the corners of the muscle rounded off, and that the muscular fibres nearest the mucous membrane of the rectum have contracted more than the others. A convex surface is thus presented by the shortening of the inner fibres, and the muscle no longer resembles a parallelogram, which was the original shape just after it was ruptured. This shortening of the fibres of the muscle has hitherto been entirely overlooked, and to this cause must we attribute the failure to re-establish control over the escape of flatus and the contents of the bowels when in a fluid state. This will always be the result if the operator only extends the denuded surface from above to A B, the apparent limit of the laceration, since but a small portion of the ends of the muscle can ever thus be brought in contact.

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[1] Laceration of the Perineum, involving the Sphincter Ani, an operation for securing Union of the Muscle. N. Y. Medical Record, March 15, 1873.

Fig. 71.

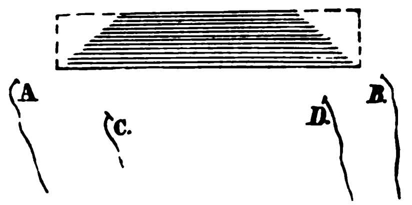
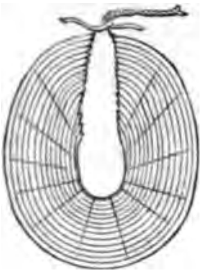


Diagram showing the retraction of fibres after rupture of the muscle.

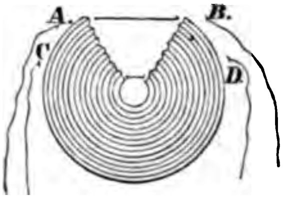
After the edges of the muscle have been properly freshened, the most important step in the operation will be to introduce the first suture in its proper relation to the edges of the divided muscle. If the first suture be entered on the line a little outside of A B, Fig. 71, and at the point which would seem the most appropriate, only a small portion of the muscle will be approximated. Fig. 72 exhibits the condition of the parts when they have been thus secured by a suture entered from A B, and shows that the retentive power is not re-established. Introduce, however, the suture at some distance behind the edge of the muscle at the points C D, Fig. 71, and a different result will be obtained. A glance at Fig. 73 will show that on securing the sutures the divided edges of the sphincter will be turned up and brought in perfect apposition. When the suture is passed from behind the edges of the muscle and around the laceration in the recto-vaginal septum, the edges of the muscle will be turned up on tightening it. As this suture runs backward obliquely across the rectal extremity, it seems at first glance as if it were impossible that it could be secured without shutting up the anus. This, however, is not the case, for the ends of the muscle are drawn upward on tightening the suture, when passed above through the recto-vaginal septum, which, to a certain extent, is a fixed point. The actual position of this suture when twisted is shown by Fig. 73 to be above the anus. As the rectum turns immediately backward into the hollow of the sacrum, the outlet is in no manner encroached upon. When this suture is secured its tendency is to roll the tissues upward and outward from the rectum towards the vagina. One effect of this is of necessity to bring in contact, below the edge of the laceration and throughout its course, a portion of undenuded mucous membrane of the rectum. This suture, therefore, along the rectal portion acts as a safeguard in relieving the second suture from tension. It is also a protection against the tendency of flatus to force a passage into the vagina. In my previous operations this second suture, passed on the same plane with the edge of the laceration through the rectum, was the first and mainstay. I then frequently noted, as the other sutures above were secured, that the tissues were forced downward. The effect of this was to spring apart, as it were, the loop of this first suture, and then a large portion of denuded tissue became rolled out into the rectum. This was the cause of the frequent occurrence of a small recto-vaginal fistula at the thinnest point in the septum. This opening was generally situated just behind the sphincter, and was difficult to close on account of the constant action of the muscle.

Fig. 72.



Faulty introduction of sutures.

Fig. 73.



Proper introduction of sutures.

The beneficial effect of the rectal tube, or of any other rounded body left in the anus, when the size of the instrument is not sufficient to act as a source of irritation, is now made clear. When, by accident, it so happened that the retracted fibres of the sphincter ani muscle were denuded, the presence of the rounded body aided greatly in the success of the operation. It, of course, could be tolerated in the anus only so long as the muscle was relaxed. Its action was to turn up the freshened edges, since it occupied a certain amount of space, and thus aided the sutures above in keeping these surfaces in contact. When the fibres were not denuded, no union of the muscle could take place, although the septum and perineum might readily unite.

The necessary position of the patient for the operation, with all other details, are essentially the same as described for closing a laceration of the perineum. The surfaces which have been lacerated, and are again to be freshened, are generally well mapped out by a slight cicatricial glaze. Under ordinary circumstances, unless sloughing has occurred, there will be but little difficulty in determining the extent. As the edges of the laceration through the septum have to be freshened with care, it is essential to commence the denuding from the most depending point, and by this means escape the annoyance of blood flowing over the parts which are yet to be cut.

If we examine carefully the extremities of the lacerated muscle, we will find a slight pit, or depression, at each end, which has been caused by the contraction of a portion of its fibres. It is necessary to freshen these surfaces, for by so doing we denude the ends of the muscle along the spaces between the dotted angles, shown in Fig. 71. At the commencement of the operation, a portion of the tissues at one of these points must be seized with a tenaculum, and removed with a pair of scissors, together with a narrow strip entirely around the laceration to the opposite end of the muscle. This strip must be removed as close to the edge of the rectal mucous membrane as can be done without wounding it. Whenever the edges of the laceration in the recto-vaginal septum are found terminating in a thin bevelled edge, it will be necessary to remove a portion of the vaginal mucous membrane in order to gain sufficient width.

Occasionally, the laceration through the recto-vaginal septum is found to terminate in a double cleft, one being much longer than the other. In this condition, success would be doubtful were we to confine ourselves only to the thickness of the walls of the laceration. Therefore, in addition, I always remove a sufficient portion from the vaginal surface beyond to include both fissures, and also, by way of compensation, in the opposite direction from these, so that, when the edges of the freshened surfaces are brought together, they will meet in the median line as if a simple laceration had occurred.

The needle is to be introduced behind the edge of the muscle to the left, at the point D, Fig. 71. It is then made to sweep around the angle of the laceration in the septum to the point of exit at C, and this is done by gradually rotating the forceps with a movement of the wrist. As in laceration of the perineum, it is necessary that the index finger of the left hand be introduced into the rectum to serve as a guide. As the point of the needle punctures the skin in its exit, the finger may be withdrawn from the rectum to aid the passage of the needle. This can be done by the counter-pressure of a blunt hook, or by sliding back the tissues sufficiently with the fingers, for the needle to be seized by the forceps and drawn through. The second suture is to be introduced just outside of the end of the muscle, and in the same plane with the divided rectal edge of the laceration. The third suture is to secure the vaginal edge of the laceration. It should be made to include the tissues liberally, and to sweep around the angle of the laceration at some distance beyond the course of the first and second suture. This is necessary because this suture is the one most liable to cut through the recto-vaginal septum and leave a fistula. The other sutures are to be introduced as in a case of simple laceration of the perineum.

It is necessary to secure first the lowest suture C, D. This is done by seizing the ends of the wire at a proper distance, so that the index fingers may be used to slide the tissues firmly down on the suture, as moderate traction on the wire is made at the same time with the hands. The suture is then secured without relaxing the traction, by several half turns made on reversing the position of the hands from one side to the other. Each suture is thus in turn secured from below upward. Experience can alone indicate the proper amount of tension to be made, and success will depend, to a great degree, upon this part of the manœuvre. The parts should be just brought in apposition, and no more, for in a few hours there will be sufficient swelling to force the tissues in close contact. If the sutures have been twisted too tightly, and especially if they have been introduced in too superficial a manner, they will cut out from behind forward. This will leave a fistula, or the tissues in front will become sufficiently strangulated to set up some inflammatory action, resulting afterwards in a labial abscess.

The twisted sutures are to be left several inches long, and are to be secured by the same method as when used for simple laceration of the perineum. I have met with but few instances where the laceration was so extensive beyond the sphincter, that the whole extent of the fissure could not be included within the deep sutures passed as

I have described. When the exception has occurred, the difficulty was easily obviated by denuding the edges, and bringing them together by a sufficient number of interrupted sutures down to the edge of the sphincter ani. These sutures were introduced at a sufficient distance apart (the same as for bringing together the edges of a fistula), then twisted, bent over flat to the vaginal surface and cut short. The after-treatment will differ but little in detail from that already described.

When the nurse is an inexperienced one, I have the patient's bowels moved by castor oil on the sixth day, and remove the sutures the day afterwards. But, if the nurse has been accustomed to the charge of such cases, I withdraw the sutures at the end of a week, and have the bowels moved a few days later, since trained nurses learn to support the parts with their fingers while the bowels are acting, so as to relieve the recently united surfaces from all strain. It is a good plan to have a small quantity of warm olive oil gently thrown into the rectum just before the bowels are moved. After the sutures have been removed, and by the method already described, the bowels must be constipated for six or seven days by regulating the diet, and by the administration of opium, if needed, in sufficient quantity to keep them quiet. The knees are to be kept tied together for several days after the removal of the sutures, and always at night for some time longer. The circumstances of the case, particularly the extent of union, will indicate the proper time when the patient may be allowed to sit up.

It is yet a mooted question how soon after the injury the operation should be performed. When the laceration has extended through the sphincter, my conviction is that in every instance, when it is possible to do so, the parts should be brought together immediately after delivery. It is true, observation has taught us that the lochial discharge is poisonous to a healing surface, yet a large number of these operations would be successful with a little additional care. The operation just after delivery would then be comparatively a simple one, and it would be unnecessary to pass the suture behind the muscle. Something would be gained in every case, and support would be given to the uterus, for a while at least, until it had become somewhat reduced, in size, and time gained for the overstretched vaginal tissues to recover their tone. A week even thus gained in giving a proper support to the parts may be the means of saving the patient from the necessity of undergoing treatment for months. This she may be spared, even if the operation itself should prove a failure.

The condition of the patient after delivery may be too critical to admit of the additional operation for bringing together the edges of an extensive laceration through the septum. Under these circumstances, I should deem it advisable to introduce the deep perineal sutures, to include as much of the septum beyond the muscle as is possible. These sutures can be rapidly introduced, and without any special care beyond including a liberal amount of tissue. If a union of the perineum is thus gained, with a portion of the septum beyond the sphincter, but a small recto-vaginal fistula will remain. This may prove a discomfort, but its closure can be safely deferred.

I am in the habit of closing this little opening by dividing the perineum and sphincter ani by means of a pair of scissors. Then the edges of the opening can be thoroughly denuded, a procedure otherwise very difficult. The parts can then be brought together and treated in every respect as if it were a case of laceration in which the surfaces had just been freshened.

I have several times closed such an opening, after denuding the edges, by passing the sutures around the fistula from the perineum. With the finger in the rectum as a guide, a suture was passed so as to close the edge on the rectal side, and another above for the vaginal border. The lower suture includes so much of the sphincter ani muscle, that its action in the upper part is controlled. By this means the fistula closes, a result which is almost impossible to be obtained under ordinary circumstances, since the outer fibres of the muscle form one side of the fistulous opening.

When an operation cannot be resorted to immediately after the injury, the knees should be kept tied together, the urine properly drawn, and the greatest care given, by cleanliness, to free the parts from irritation. At the reception of the injury, the rent through the septum is more extensive than after the edges have cicatrized; therefore, if proper care be taken, by frequent injections of tepid water, to keep the parts free from irritating discharges, the edges will unite to within a short distance of the sphincter. Before the patient is allowed to assume the upright position, some mechanical support must be resorted to for the purpose of lifting the uterus from the floor of the pelvis. The effort must also be made to keep the organ partially anteverted, so that there may be no prolapse of the vaginal walls.

After the woman has recovered her strength, if the child has been stillborn, the operation should be performed without further delay. For the welfare of the child, if the mother nurses it, the operation should be deferred until it is old enough to be weaned with safety. But, at the same time, we must take into consideration the condition of the mother, as to how long she may be safely subjected to the delay, care being had always to keep the uterus well supported.

CHAPTER XXI.

INVERSION OF THE UTERUS.

Causes — Frequency — Symptoms — Diagnosis—Treatment—Method of Valentin, White, Tyler Smith, Noeggerath, Courty, Simpson, Thomas, Barnes, Byrne, Watts, Tate, Dandridge's suggestion, Emmet—By continued moderate pressure —By amputation.

INVERSION of the uterus is a condition in which the uterus has become either partially or completely turned inside out, so that more or less of the inner surface forming the uterine canal projects through the dilated os into the vagina. The injury results from chidbirth, or from the growth of some interstitial tumor which had already begun to project into the uterine canal.

Dr. West[1] makes the following statement: "No instance has come under my observation of uterine invervsion in the recent state, and, indeed, the annals of the Dublin Lying-in Hospital, and those of the London Maternity Charity, sufficiently illustrate the rarity of the accident, since it was not once met with in a total of more than 140,000 labors." The accident is, therefore, comparatively a rare one.

It has become a tradition in the profession that inversion of the uterus is in some manner always due to traction made on the umbilical cord in the delivery of the placenta. Under certain circumstances, it is possible, when the placenta is attached directly to the fundus, that inversion may sometimes take place if much force is used in detaching it; but I believe the injury is rarely due to this cause. If it were due to this cause, the lesion should be a more common result of the pulling upon the cord which has been employed, down to the present day, by all the old women to be found both within and without the profession.

Schroeder[2] offers the following explanation of inversion produced by tumors; "Inversion is doubtless brought about in this way—the uterine foundation, or base of the tumor, which consists of normal uterine tissue, becomes atrophied (either disappearing or undergoing fatty degeneration) by means of the pressure which the tumor exerts. A gap is thus formed in the firm contractile uterine tissue; the tumor sinks into the cavity of the womb, and is driven towards the mouth both by its own weight and by the contraction of the organ. The os then opens, and the tumor sinks into the canal of the cervix, and thus the adjacent portions of the uterine wall being drawn down, a complete eversion is gradually accomplished. In some cases, however, after the tumor has sunk a certain distance into the cavity of the uterus, the inversion is rapidly accomplished by means of uterine contraction."

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[1] Lectures on the Diseases of Women, p. 231.

[2] Ziemssen's Cyclopædia, vol. x. p. 215.

These views are unquestionably correct, and are in accordance with my own observations. By reference to the chapter on fibrous tumors in this work, essentially the same explanation will be found as was offered by me several years ago, in reference to the method by which tumors become pedunculated. During an operation on a case in March, 1874, with my hand in the uterus I was able, for the first time, to appreciate accurately the process. I then advanced the opinion, and have frequently advocated it since, that inversion of the uterus resulted in the manner described, by irregular and independent fascicular contractions of the muscular tissue.

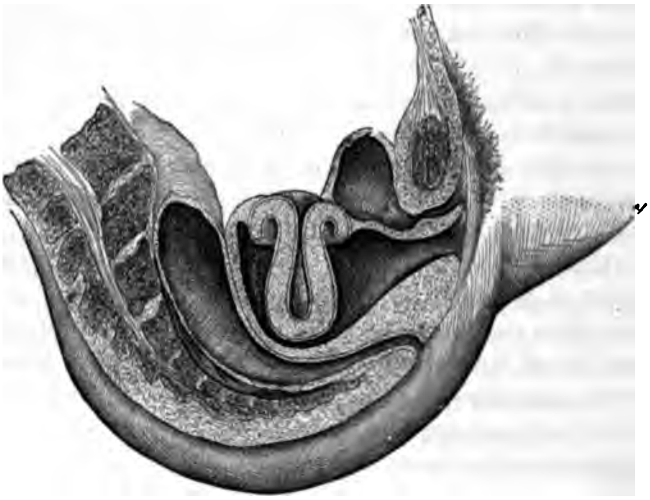
As a rule, inversion takes place between the birth of the child and the delivery of the placenta. It is marked, generally, by symptoms of sudden shock and hemorrhage, but the shock is out of proportion to the actual loss of blood, for this, although often free and continuous, is frequently not detected before the collapse. The contractions of the uterus afterwards are often violent, and cause much suffering from reflex irritation of the bladder and rectum. Under some circumstances the accident may be attended with so little disturbance that the question must remain an unsettled one as to the exact time of its occurrence. Cases of this description have been reported where the inversion was supposed to have taken place days after delivery, and others where the condition was only detected by accident, presenting no symptom of trouble other than a watery discharge or a leucorrhœa.

An inversion of the uterus is, however, generally accompanied by a constant oozing of blood, which eventually produces a most profound degree of anæmia. There is an inability to exercise, and in some cases œdema of the face as well as of the extremities. On assuming the upright position, nausea or vomiting is frequently excited, together with palpitation and irregular action of the heart, all of which symptoms are due to the loss of blood. Instances have occurred where women have had the vitality to resist the consequences of inversion of the uterus for twenty or thirty years, until, at length, with a change of life the drain has ceased.

There can scarcely be any difficulty, just after its occurrence, in forming a diagnosis of inversion resulting from childbirth. The uterus at this time is generally large enough to project from the vagina, and may have the placenta still adherent to it. But after the uterus has contracted to nearly its natural size, it may become a difficult matter to make the diagnosis between an inversion and a pedunculated fibroid.

Fig. 74 illustrates the usual condition existing with an inversion of the uterus to the vaginal junction; the fundus is seen projecting into the vagina through the ring formed by the dilated cervix.

Fig. 74.



Inversion of the uterus.

In such a case the use of the sound would, under ordinary circumstances, indicate the condition, since it could only be introduced between the mass and the cervix, to the same depth on all sides. But occasionally other lesions are met with which might mislead and render a diagnosis doubtful. Several instances have occurred in this city, and many others are on record, where the mistake has been made of removing an inverted uterus for a supposed polypus. It is, therefore, most important to determine accurately the true condition, and always to treat the case as one of inversion so long as any doubt exists, otherwise a simple operation practised for the removal of a polypus may, if it be an inverted uterus, prove a fatal error.

I have myself tightened the chain of an écraseur around the pedicle of what was supposed to be a polypus attached to the fundus at a distance of over two and a half inches from the cervix, which, on further investigation, proved to be an inversion. In this instance the uterus was enlarged, and a fibroid at the fundus, which had caused the inversion, stretched out by its weight the body to such an extent that it was not larger than the index finger, thus giving it every appearance of being the pedicle of a fibroid. Then, to add to the deception, the sound passed to a natural depth alongside of this mass into what was supposed to be the whole uterine canal. The diagnosis was not settled until, by means of the chain of the écraseur, the mass was drawn down to the vaginal outlet, and the indented portion at the seat of inversion was distinctly felt by a finger introduced into the rectum. This could not be reached before, or detected through the abdominal wall, on account of the thickness of the adipose tissue.

Within a few days of writing this chapter a case was under observation at the Woman's Hospital, in which it could not be determined whether the uterus was, or was not, inverted. The woman was very fleshy; there was scarcely any pedunculated shape in the mass, and at one side only could a sound be introduced to a greater depth than an inch, beyond which, for some two inches and a half, it seemed to pass only into the opposite horn of the uterus. I had made a diagnosis at first of a polypus, but on a further examination the case seemed to be one of inversion commencing at the right horn of the uterus. I attempted for an hour and a half to reduce it, but without success. A week later I passed a slip-knot of tape high up around the mass, by introducing the hand into the vagina, and by this means gently drew it down to the outlet. I now discovered a difference in the character of the tissue covering the mass, and as no constriction could be detected by examination through the rectum, the probabilities were in favor of a fibroid. After some difficulty, I enucleated a tumor nearly as large as a hen's egg, which had been crowded out from the uterine wall, and with it a thick layer of uterine tissue covered by mucous membrane, so as to present all the appearances of an inversion.

Some years ago, the late Dr. Henschel exhibited, to the New York Obstetrical Society, a specimen of polypus which projected into the vagina, and had become adherent all around to the sides of the cervical canal, so that a probe could not be passed in any direction.

Dr. Sussdorff, of this city, has reported[1] a case of hollow polypus which was attached in the same manner, and to increase the difficulty of diagnosis, the uterus was afterwards found completely retroverted. This condition could not have been detected under the circumstances, unless the precaution had been taken to introduce a finger into the rectum and another into the vagina at the same time, for the retroverted uterus, as felt from the rectum, would naturally have been mistaken for the tumor in the vagina; and in the absence of the uterine body from the relative position it should occupy, the diagnosis of inversion of the uterus would have been a natural one.

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[1] Am. Journ. of Obstetrics, etc., Oct. 1877.

It has been stated that pain is excited by grasping the mass if it be an inversion, while the contrary is the case with a polypus. This I have noticed in several instances in which also contraction was excited by grasping the mass, but with other cases the uterus was as little sensitive as a polypus.

Under ordinary circumstances the existence of an inversion can be determined by the history of the case; by the absence of the uterine body from its natural position, as shown by the facility with which a sound in the bladder and a finger in the rectum may be approximated at that point; and, beyond question, on detecting the cavity formed at the seat of inversion; and by using the probe to ascertain the depth of the uterine canal.

Treatment.—Formerly, unless the accident were recognized early enough after labor to enable the fundus to be returned before the organ had contracted, there was nothing else to be done but to remove that portion of the uterus projecting below the point of inversion. I may be trenching somewhat on the province of the accoucheur in treating of an inversion which has just occurred, but unless I do so the history of the lesion will be scarcely complete.

When inversion takes place, and the placenta is still attached, the question may arise as to the proper treatment. While all authorities agree as to the necessity for an immediate reduction, there exists a difference of opinion as to the removal of the placenta through fear of hemorrhage. To attempt the reduction with the placenta attached would prove a very difficult procedure, and even were the necessity greater for doing so, the loss of time which it would necessitate, in consequence of the contraction, might well be advanced as a serious objection. The fear of hemorrhage, from removing the placenta before reduction, I suspect is based entirely upon theoretical views, drawn from false premises, since the uterus could not have become inverted unless from contraction, and this condition is not one favorable to a prolonged loss of blood. The uterus continues to contract afterwards, and the great fear lies in the loss of time which may, on account of the contraction, render the reduction difficult. I therefore advocate the removal of the placenta, and the immediate carrying up of the fundus to its proper position, when possible, by introducing the hand into the vagina. The uterus in this state will at times contract violently, and then become relaxed. If the uterus should have already become much reduced in size, it will be impossible to return the fundus while the organ is in the state of contraction. It will first be necessary to indent some part of the fundus, in the interval of relaxation, and this portion may be then rapidly carried up on the point of the finger. While the reduction is progressing, a bed-pan can be placed under the hips, and a basin of hot water procured, so that as soon as the inversion is overcome, the operator without removing the hand, may, with the other, introduce the long nozzle of a Davidson's syringe within, and throw a stream into the uterine canal. The injection of hot water will certainly excite reflex action, so that the bleeding, if it should have continued, will be arrested, as in post-partum hemorrhage, and the inversion cannot again take place, since the whole uterus will be firmly contracted.

Not being in obstetrical practice, I have never, myself, tested the action of hot water in such a case. But I have no doubt of its value, and I have for more than ten years urged in my clinics and among my friends its use in post-partum hemorrhage, to bring about the usual condition of contraction. The remedy is certainly most efficacious for the purpose, if it be properly applied within the uterus, at a high temperature, and in sufficient quantity.

I can, beyond question, claim the credit of having first recommended its use for this purpose, based, not upon theoretical views, but upon actual practice. I had already, for years before, been familiar with its action in exciting uterine contraction whenever I removed a tumor from within the uterus.

As already stated, the condition was formerly regarded as a hopeless one after the uterus had once contracted, and from the time of Ambrose Paré down to the present generation the ligature was the only resort, with or without the use of the knife afterwards. The late Dr. Charles D. Meigs, of Philadelphia, in his Letters[1] to the students of his class in 1846, wrote: "You might as well try to invert one of the non-gravid uteri on my lecture-room table as to reposit this one—the time is gone by." He had reference to the possibility of restoring the inversion after the organ had contracted. Yet he cites two cases which occurred in his own practice, of spontaneous recovery followed by pregnancy, where his diagnosis as to the inversion had been confirmed by Prof. Hodge and Dr. Warrington. No reasonable doubt can be advanced, as to the correctness of the diagnosis, by any one familiar with the skill of these gentlemen. Dr. Meigs, in his work, refers also to other similar instances, but they are not from so authentic a source, and the question of an error of diagnosis might be raised.

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[1] Woman: her Diseases and Remedies.

A number of cases of inversion of the uterus have been reported to the medical journals, and others are to be found in the earlier works, where the accident had been recognized and the reduction accomplished almost immediately after the occurrence. The uterus is generally well contracted in twelve hours, and with many cases it would be then quite as difficult to effect a reduction as if a year had elapsed. Nevertheless, I have found on record that Dr. Eb. Skae,[1] of Edinburgh, in 1845, reduced an inversion twelve hours after its occurrence, which followed a miscarriage at four months. In consequence of the inversion from a miscarriage this case is notable. In 1847, Dr. E. H. McCoy, of Harrisville, Ohio, reported[2] a case he had reduced two days after delivery. This case seems to have been the first reduced in this country after so long a delay had intervened from the delivery.

The publication of M. Valentin's case (*Revue Médico-Chirurg.*, Nov. 1847[3]), showing that he had succeeded in reducing the uterus sixteen months after it became inverted, established the operation as a feasible one, and afforded a definite plan of procedure. After describing the mode of delivery (which occurred April 8, 1846) and the condition of the woman for a year afterwards, his method of reduction is given as follows: "After several months devoted to the recruiting the strength, on the 15th of August, 1847, the vagina was dilated by sponge tents, and the female was placed on the edge of the bed, as for the application of forceps. The left hand of the operator then grasped the hypogastrium, the uterus itself was seized by the fingers and thumb of the right hand, and pressure made; but the screams of the patient caused the operation to be for the time abandoned.

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[1] Ranking's Abstract, American edition, January, 1847.

[2] American Journal of the Medical Sciences, July, 1847.

[3] Ranking's Abstract, American edition, January, 1848.

"On the 26th another attempt was made, with the aid of ether inhalation. The patient being rendered insensible, the same manipulations were gone through with, but, as before, the uterus was altered in form, without the fundus yielding, as was wished. The attempt was persisted in for ten minutes without progress, when etherization was carried to the extent of reducing relaxation of the sphincters. At this moment the collapse of the system was complete, and the uterus partaking of the relaxation, the fundus allowed itself to be depressed under the finger, until, at length, it became suddenly restored to its normal state."

Dr. S. W. Merriman reports[1] a reduction performed by M. Barrier, of Lyons. Chloroform was used, and very much the same method was employed as that given by Valentin. The duration of the displacement is not stated, but the inference is that it was about eighteen months.

Mr. George Canney, of Bishop-Auckland, gives[2] another successful case, after five months' inversion. The same plan of reduction was followed, chloroform being also employed.

To the late Dr. John V. Quackenbush, of Albany, N. Y., is doubtless due the credit of having been the first in this country to reduce a chronic inversion of the uterus. He is even entitled to greater credit, since, as I have been informed by himself, at the time of operating he regarded the procedure as original, and was ignorant of the success of Valentin and others before him. The reduction was performed by Dr. Quackenbush April 29, 1855, and reported to the New York State Medical Society February 3, 1859.

The next to make the attempt in this country was Prof. James P. White of Buffalo, who operated March 12, 1858, and reported the case to the Buffalo Medical Association in the following April.[3] The inversion had existed for fifteen years. Dr. Tyler Smith, of London, operated for the first time in 1856, but his report of the case was only made to the Royal Medical and Chirurgical Society, April 13, 1858. In this instance, the inversion had been of twelve years' standing. Dr. Noeggerath, of New York, reported a successful case in the *American Medical Times*, 1862, which had been of thirteen years' duration. Since this time the operation has been generally accepted by the profession, and the number of successful cases, both in this country and abroad, has rapidly increased. As a consequence of increased experience, no operator of the present day would abandon any case on the plea of being irreducible. Prof. White has operated, and with success, on a larger number of cases than any other member of the profession.

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[1] Medical Times and Gazette, Sept. 4, 1852. [2] Ibid., Sept. 18, 1852.

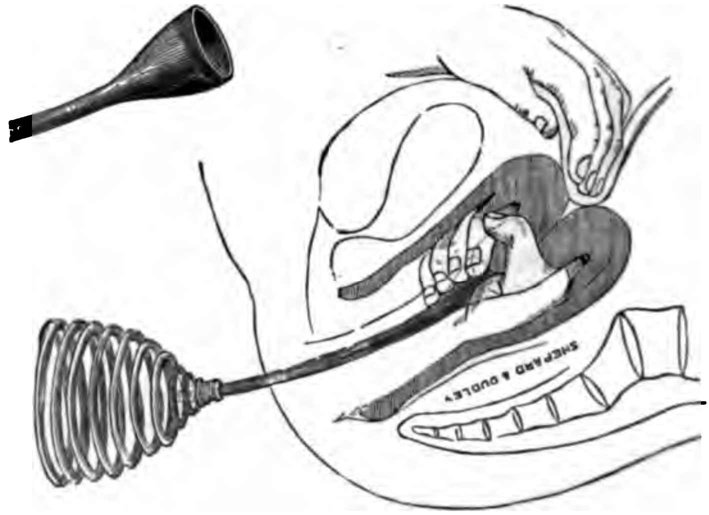
[3] American Journal of the Medical Sciences, July, 1858.

Since no method yet proposed is applicable to the reduction of every inversion, various expedients have been resorted to under the different circumstances.

Preparation for the Operation.—Under all circumstances the contents of the rectum and bladder must be removed before commencing the operation. An anæsthetic is indispensable. The position which seems to have been universally settled upon as the best for the operation is that on the back, with the lower limbs drawn up and flexed on the abdomen, and thus held by an assistant standing on each side. The hands of the operator must be thoroughly washed and softened in warm water. One hand, with the forearm bared and well greased, is carefully passed into the vagina, to execute any special manipulation decided upon, while the other hand is to be employed for steadying the uterus by making counter-pressure above the pubes.

Valentin's method has already been described, and is the one which would naturally be suggested. Dr. Quackenbush, in his case, employed essentially the same plan.

Fig. 75.



White's Repositor.

White's method.—One hand is introduced into the vagina for the double purpose of grasping the inverted portion of the uterus and, at the same time, keeping pressed against the fundus an India-rubber cup, from which, projecting outwards, is a short staff, having at its other end a stout steel spiral spring (see Fig. 75). This spring has a pad at its extremity (not shown in the figure), and is intended to rest against the body of the operator, so as to maintain a steady pressure. The effect of this is to put the vaginal canal on the stretch, so that by traction on the walls the ring at the seat of inversion above may be dilated. The other hand is employed to steady the uterus, and, at the proper time, to aid by making counter-pressure, with the view of rolling out the tissues at the seat of inversion.

Tyler Smith's method was to mould and compress with the fingers the inverted portion of the uterus every night and morning for ten days, and then to keep up steady pressure by fully distending the vagina with an inflated India-rubber bag. At the end of a week it was found that the uterus was returned to its normal position.

Noeggerath's method consists in compressing the body of the uterus, opposite to each horn, between the thumb and finger, so as to indent it on one side or the other. When this can be accomplished, the indented horn of the uterus is crowded like a wedge into the canal formed by the inversion, and it is then soon followed by the remainder of the fundus and whole body of the uterus. This plan has been attended with success in several instances to my knowledge, and it is particularly applicable for recent cases of inversion.

Courty's method, as described in his work, was in one instance successfully employed after other means had failed. The uterus was drawn down by a vulsellum to the vaginal outlet, two fingers were then passed into the rectum and separated so as to hook over the mass on each side of the seat of inversion along the utero-sacral ligaments. Firm pressure was now made with the other hand in the vagina, by grasping the pedicle or body of the uterus, and pushing it backward. The mechanical effect would be exerted with little loss of force, since the fingers in the rectum steady the uterus, and, from their position, aid in rolling out the edges at the seat of inversion as the body is being crowded up from below by the hand in the vagina.

Simpson's and Thomas's method.—According to Dr. Robert Barnes,[1] "this consists in making an incision through the abdominal wall so as to get at the constricted os uteri from above, and then applying a dilating force. The idea was enunciated by the late Sir James Simpson at the discussion of my paper before the Medico-Chirurgical

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[1] American edition of his work, page 632.

Society in 1869." Dr. T. G. Thomas, of New York, has been bold enough to put this suggestion into successful practice in two instances, with the result of death from peritonitis in one of the cases. From a conservative stand-point, I should not advocate the practice. Dr. Thomas frankly states that the abdominal section "is not offered as a method for treating inversion of the uterus, but as a substitute for amputation."

Barnes's method.[1]—In 1868, Dr. Barnes, having failed in the reduction by Dr. Tyler Smith's plan, drew down the inverted uterus to the vulva by a slip-knot of tape. "I then," he says, "made three incisions in the neck about a third of an inch deep, one on each side, and one behind in a longitudinal direction, that is, across the fibres of the cervical sphincter. Then, compressing the uterus with my left hand, and supporting the os uteri by the fingers of the right hand through the abdominal wall, I found the cervix yield, and the body went through into its place. The cervix yielded by laceration extending from the incisions, and I very much feared at the time that serious, if not fatal, mischief had been done. No material inconvenience, however, followed; an examination three weeks afterwards showed the cervix and uterus to be in their proper places. Nothwithstanding the successful issue, I believe that the method should only be resorted to after a full trial of Tyler Smith's plan, and then with great caution. I should recommend that only two incisions be made, one on each side of the os, and these of moderate depth." This operation has been put in practice by Drs. Sims and Thomas, and Sir James Simpson also recommended it. With the greater number of cases the hemorrhage, as in Dr. Thomas's case, must be excessive, and the procedure should not, therefore, be adopted except as a last resort.

Byrne's method.—Dr. John Byrne, of Brooklyn, describes, in the *N. Y. Med. Journal*, Oct. and Dec. 1878, an instrument which had been already employed by him with success in one case, and by Dr. T. G. Thomas in another instance. This consists of a curved stem with a cup attached to one end, so that it bears a general resemblance to White's repositor, which has been already described. But instead of a simple depression for the fundus to rest in, the cup is made of several sizes and is intended to receive the whole inverted portion of the uterus. Through the stem passes a rod to a disk forming a false bottom to the cup. With counter-pressure through the abdominal wall above, the rim of the cup containing the uterus is passed up to the seat of inversion, then with steady upward pressure from the whole instrument, the false bottom is gradually advanced. As the sides of the cup prevent all lateral spread of the uterus the tissues must be crowded up to the seat of inversion as a wedge. From the abdominal wall the counter-pressure is maintained by "an open bell-shaped cup, through the centre of which passes a screw, provided at its lower end with a conical plug of hard rubber, and on the opposite, or outer extremity, a flat knob for a handle. When about to be used, the handle should be screwed down so as to project the plug a suitable distance beyond the margin of the cup. The uterus being raised upward and forward by means of the repositor, as heretofore described, there will be no difficulty in recognizing, through the abdominal parietes, the funnel-shaped depression of the inverted cervix, in the centre of which the dilating wedge should be inserted. The uterus, thus fixed between the two instruments, should now be lowered in the pelvis so as to remove all strain from the vagina, and, the bell-cup having been turned down in close contact with the abdominal surface, the work of restoration may be commenced. *It would be well to remark that the duty of the assistant in charge of the external parts will be simply to maintain a degree of passive counter-force sufficient to resist pressure from below.*"

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[1] Barnes on Diseases of Women, page 636.

"So soon as it appears reasonably certain that progress has been made, and this will, probably, be indicated by an increase in the diameter of the abdominal ring, as also by the ascent of the repositor, the dilating wedge should be screwed back entirely within and above the brim of the cup, so as to *remove all central pressure.*"

"I will merely add, that the size of the repositor-cup should always be regulated, as nearly as possible, by the estimated bulk of the mass which it is designed to accommodate, to the end that the uterus, when securely boxed up in this cylindrical case, may not have its transverse diameter increased by spreading, or its tissues unequally compressed by any reasonable or required amount of upward pressure."

In both of the cases referred to above, the reduction was rapidly brought about by this instrument.

Watts's method.[1]—Feb. 23, 1878, Dr. Robert Watts, of this city, succeeded in reducing a case of inversion at the Roosevelt Hospital in the following manner. He first drew down the uterus so as to make it protrude partially from the vaginal outlet, and then passed his fingers into the rectum, as in Courty's method. But instead of using the fingers in the rectum simply for counter-pressure, he passed a finger into the depression formed at the seat of inversion. Then by means of the hand grasping the uterus at the mouth of the vagina, the organ was gradually pushed down on to the finger, which of course carried before it a portion of the anterior rectal wall. He soon succeeded in getting two fingers through the ring, when it became sufficiently dilated for the fundus to be pushed up on the point of the index finger without further difficulty, and the restoration was completed.

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[1] Am. Journ. of Obstetrics, N. Y., Jan. 1879.

I was called, as one of the consulting board, to see this woman with Dr. Watts, when she was first admitted to the hospital. She was a young negress who had given birth to at least one child, but my impression is that the time at which the inversion occurred could not be accurately determined from the history which was elicited. A small fibroid, however, was found at the fundus which may have produced the inversion. This tumor was enucleated, and attempts at reduction were made, which failed. Subsequently another effort was undertaken and persevered in. I assisted Dr. Watts, but we did not accomplish more than to advance the fundus within the cervix. I was unable to assist him at the final effort, but after resorting to the plan described, the reduction was rapidly accomplished.

Tate's method.[1] This plan of reduction follows naturally in connection with the method just described. Dr. J. H. Tate operated at the city hospital, Cincinnati, on a woman 78 years of age who had not been well since the birth of her child, 36 years previous to her admission. Her condition was one of complete procidentia with the uterus entirely inverted. The escape of the uterus from the vagina had only existed for six years, and had resulted from a severe fall.

After the patient had been placed under the influence of chloroform, Dr. Tate passed the fore and middle finger of the right hand into the rectum and pushed them up beyond the uterus to gain a firm point for counter-pressure. Then both thumbs were placed against the fundus and strong pressure made to push it inward. After some time the fingers in the rectum became so fatigued that they allowed the uterus to slip from their grasp. At this stage of the operation Dr. Dandridge, who was present, suggested that if the finger of the left hand was inserted in the bladder the parts could then be firmly held and the counter-pressure be more complete. The urethra was dilated in a moment or two, and then the forefinger of the left hand carried through it into the bladder and placed over the rim of the os, directly opposite where the fingers rested which had been introduced into the rectum. "The uterus was thus firmly held between the fingers in the rectum and bladder at the cervical end, and the balls of the thumbs rested over the fundal extremity, and now the pressure on the fundus was renewed. In a few moments a decided impression was made, the fundus became deeply indented. At this point a star candle with a soft rag wound around its end was planted against the fundus in place of the thumbs, and with strong pressure made against that part the inversion was soon completely reduced."—"The whole operation did not occupy more than thirty minutes. To insure retention a silver suture was made to bring together the lips of the os uteri, and then the prolapse was reduced."

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[1] Inverted Uterus of forty years' standing, reduced in half an hour. A new method. Cincinnati Lancet and Observer, March, 1878.

With the length of time the lesion had existed, and from the rapidity with which the operation was completed, this is the most remarkable case of reduction on record. From a purely mechanical standpoint, with the application of power so direct and with no waste of force, the principle is nearer to being perfect than any other means which has yet been devised. The force brought to bear is very similar to that to be described hereafter, which is exerted when the cervix has been closed by sutures over a partially reduced fundus. But no comparison exists between the amount of power which could be safely exercised in one case, and that which would soon tear the sutures out. The dilatation of the urethra and the risk of injury from the pressure of the finger is a serious objection to the plan. I would therefore advise the opening of the base of the bladder in every instance where this method is to be tried. The operation to be described hereafter, for the removal of stone from the female bladder, would be found very simple of execution, and the one well fitted for this purpose. Every advantage for the application of the necessary power would be presented with two fingers of one hand in the rectum, and the corresponding ones of the other, through this opening in the bladder, so that they could be hooked over the uterus, and draw it down to the vaginal outlet. With steady counter-pressure the fingers would rapidly dilate the canal on one side as the advance of the fundus would do on the other, and each would exert a force to aid in the rolling out of the parts at the opposite end. After the reduction had been completed, and the uterus restored to its proper position, the opening between the bladder and vagina could be readily closed by means of a few interrupted sutures. Closing this opening would only necessitate the remaining in bed for a few days longer and the regular use of the catheter for a time, which might be required under any circumstances. If it be proved, after further experience, that this plan does offer the operator so much advantage, the existence then of a vesico-vaginal fistula, which under any circumstances could be but a temporary inconvenience, should not be regarded as a serious objection.

Emmet's method.—In 1865 I succeeded in effecting a reduction in the following manner: my hand was passed into the vagina, and, with the fingers and thumb encircling the portion of the body close to the seat of inversion, the fundus was allowed to rest in the palm of the hand. This portion of the body was firmly grasped, pushed upward, and the fingers were then immediately separated to their utmost; at the same time the other hand was employed over the abdomen in the attempt to roll out the parts forming the ring, by sliding the abdominal parietes over its edge. This manœuvre was repeated and continued. At length, as the diameter of the uterine cervix and os was increased by lateral dilatation with the outspread fingers, the long diameter of the body of the uterus became shortened, and the degree of inversion proportionately lessened. After the body had advanced well within the cervix, steady upward pressure upon the fundus was applied by the tips of all the fingers brought together.

This method will be described more fully in the history of several cases which are to be presented in detail. At the same time there will be given a plan for closing the lips over the fundus after a partial reduction (and this may essentially be included in Emmet's method), for the purpose of preserving for a time the advance already gained, or to prevent a recurrence of a complete inversion when the whole amount cannot be reduced.

CASE XVI.[1]—Mrs. Q., aged 24, came under my charge Oct. 8, 1865. She had menstruated for the first time at eleven years of age, with no return for a year, but after this period she became regular and continued in perfect health. She was married at twenty-two years of age; soon afterwards became pregnant, and went to full term. Labor commenced between the hours of nine and ten P. M. March 11, 1865. About eleven A. M. the membranes were ruptured, and de[illegible] of a large male child took place an hour afterwards, labor [illegible]tinued nearly thirteen hours. As the head passed the [illegible] was discovered that the umbilical cord had made several turns around the child's neck. The cord, as stated, was slipped over the head without traction, the body followed immediately, and soon afterwards the placenta. Within an hour after delivery the patient suddenly became faint, with violent after-pains coming on. This condition continued for forty-eight hours with a bloody discharge, which, at the time of each pain, was expelled from the vagina with considerable force. After the pain had ceased, the flow continued more than natural, and at times was almost of pure blood. About a week after delivery the nurse discovered a mass presenting just within the vagina. An examination was made by the attendant, a consultation called, and the case pronounced, as the patient stated, one of cauliflower growth. At the end of a month her general health became so much impaired by a constant sanguineous discharge, that Dr. McCall, of Utica, was consulted, and he recommended her to my care. On making a vaginal examination, a soft mass somewhat larger than an egg was felt lying in the axis of the vagina, and being pedunculated, might well have been mistaken for a polypus. I passed two fingers of the left hand well up into the cul-de-sac behind the mass, so as to lift the uterus above the pubes, and, with the other hand over the abdomen, I was able to approximate the two sufficiently to satisfy myself that the case was one of inversion. She presented every indication of suffering from extreme anæmia.

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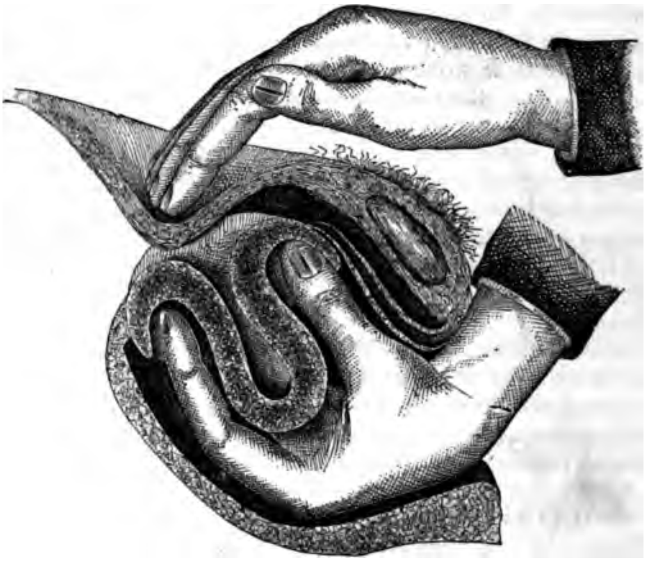
[1] [illegible]d before the New York Obstetrical Society, Nov. 21, 1865.

Oct. 10. Pulse 160 per minute; at 12.30 P. M. she was placed under the influence of ether. Since it was a serious question if, in her reduced condition, the anæsthetic could be continued long enough to effect the reduction, I requested Drs. George T. Elliot, Jr., Sabine, and Thomas to aid me with their counsel. She came fully under the influence of the anæsthetic in a few moments, with the effect of reducing the pulse in frequency, and making it fuller.

The patient had been placed on a table of a convenient height for me to operate while seated, and lay on the back with knees drawn up. The left hand was passed entirely within the vagina, and by pressure of the fingers the fundus "dimpled," while the organ was steadied by the right hand over the abdomen. At the end of an hour I found that little progress had been made, but the fundus had become somewhat smaller from pressure.

There was full time for reflection, when it became evident to me that the mode of reduction by pressure made at the fundus was not so applicable when the uterus had already contracted to nearly its natural size. As the fundus was indented by pressure, the body spread laterally beyond the cervix, and, although it materially dilated the neck by flattening it, the power was lost, without influencing to any extent the point of constriction. In fact, a continued force from the fundus in the upward direction seemed to increase the difficulty by rolling in the parts at the point of inversion. With this view, I allowed the fundus to drop into the palm of my hand, and passing the thumb and finger around the mass as high up as possible within the cervix, as shown by Fig. 76, I continued to enlarge the space between the neck and inverted body, by forcibly expanding the fingers as much as possible. At the same time I made steady upward pressure with a view of returning first the portion last involved. This manœuvre was aided by lifting the organ above the pubes, and endeavoring, with the other hand, to roll out the inverted portion by sliding the abdominal wall over the point with some pressure (see Fig. 76). In the course of half an hour, the progress of the reduction

Fig. 76.



Author's method of reducing an inverted uterus.

was marked. The globular mass which was felt through the abdominal parietes in the beginning now gradually became oval laterally, with a marked depression in the centre. By this time my hand had become almost powerless, and I was obliged to call on Dr. Elliot to relieve me for a few moments; I then continued the manipulation for some three-quarters of an hour longer, when Dr. Thomas, who had been absent during the previous hour, returned. From his appreciation of the progress made, the only fear I entertained of final success was a failure of the patient's power of endurance. Gradually the fundus passed entirely within the cervix, but beyond this point, for an hour longer, but little advance was made in the reduction. The depression, however, felt through the abdominal walls, above the seat of inversion, had become large enough apparently to admit the extremities of three fingers, and there was a proportionate increase in the size of the mass. During the whole time the patient was kept profoundly etherized by Dr. Perry. This was found necessary from the fact that in the beginning, when its influence was lessened to any degree, vomiting came on immediately, and with any movement of the patient it was impossible to steady the uterus or maintain the necessary amount of pressure. The pulse had continued good throughout, and her general appearance was satisfactory. Shortly before four o'clock she began to fail; at ten minutes after that hour her condition had become critical, and I was obliged to abandon my efforts for the time, in consequence of the powerless condition of my hands. In consultation, the opinion was unanimous that it would jeopardize the life of the patient to continue the etherization longer. At my request a last effort was made, for I was satisfied that I could not be deceived in the fact that the depression felt through the abdomen was slowly becoming larger. Drs. Sabine and Elliot, after a few moments, desisted from their efforts, as the latter gentleman had advised a frequent change, so that, the hand of each operator having been rested, the power exerted would be maintained in a more uniform manner. Dr. Thomas, who had been present but a short time since the commencement of the operation, returned just as we were desisting. He passed his hand into the vagina, and, as he describes it, drew down the mass so as to reproduce the inversion, and, on immediately returning it, found that it did so beyond its previous position; he repeated this manœuvre, and on returning it, on the point of his finger (without force on his part, as he stated), the fundus passed on, and the reduction was completed, after an effort of three hours and fifty-five minutes. During at least three hours and a half of this time I was attempting the reduction with either the one or the other of my hands in the vagina.

The patient speedily recovered consciousness. During the vomiting, as a precaution, I passed the index finger directly into the relaxed canal of the uterus which was presenting immediately within the labia. It was fortunate that I did so, for on the instant I felt a portion of the posterior wall, near the fundus, become indented. With the other hand on the abdomen, I seized the organ and restored the portion on the point of my finger, and retained it in the canal until the paroxysm had passed. It was the only effort at vomiting, and there was no return of the inversion.

At 5 P. M., with a pulse of 130, twenty-five drops of Magendie's solution of morphia were administered, with beef-tea, by the mouth. At 9 P. M., pulse 128, as she was suffering from pain generally over the abdomen, thirty drops of Magendie's solution were again given. She was sleeping quietly at 10.30 P. M.; pulse 112 per minute. At midnight the pulse was 108, and she had been sleeping since the last visit.

Oct. 11. At 9 A. M., the pulse was 110; she was free from pain, and had passed a quiet night. As there was some tenderness on pressure over the abdomen, a large poultice was ordered. At noon her condition was comfortable, but the pulse was 120, with some increase of tenderness over the abdomen; ordered the morphine to be repeated. Half-past 2 P. M., she was free from pain and sleeping quietly, with the pulse 105. At 7 o'clock P. M. the pulse was the same; repeated the morphia.

12th, 9 A. M. Pulse 100; she was entirely free from pain, and had passed a very comfortable night. From this time she was kept quiet in bed for twelve days, and no further treatment was necessary. November 28 she visited me, after taking a long drive. I found that the uterus had returned nearly to its normal size. She had menstruated naturally a few days before, and was rapidly regaining her strength and flesh.

This lady has recently died, I learn from an attack of pneumonia. She lived some twelve years after the operation, and in that time gave birth to five children, all in natural labors.

On presenting this case to the Obstetrical Society, I claimed that the point was one of great interest and worthy of discussion, as to what bearing the manœuvre, as practised by Dr. Thomas, had on the result, and, if effective, to determine the exact circumstances under which it should be resorted to. My own impression was expressed to the effect that Dr. Thomas was mistaken as to the extent of inversion reproduced by him. The portion below the constriction was flaccid, and could be readily drawn down, but above the engaging point, where the surfaces were forced into such close proximity, it was a question whether more force would not have been requisite to reproduce the condition existing at the beginning than it was possible to have exerted. Dr. Thomas's effort, doubtless, hastened the issue, yet as the widest portion of the uterus was already so far advanced within the canal, it was probable that the unaided muscular action of the organ itself might, at this stage, have soon completed the reduction, as, judging from the result, the canal was evidently already dilated sufficiently for the purpose. This was demonstrated on an India-rubber ball which had been indented, and it was shown that as soon as restitution has once commenced it rapidly progresses to its consummation.

The paper was discussed at length by Drs. Elliot, Noeggerath, and Budd, and these gentlemen fully sustained my views. In fact, Dr. Thomas himself, with great candor, stated that he was satisfied he had been mistaken.

CASE XVII.—Dr. Gouley, Feb. 17, 1866, requested Dr. Noeggerath and myself to see a case of inverted uterus under his charge in St. Vincent's Hospital, of this city. With his permission I reported the case,[1] as possessing additional interest, from the fact that the reduction was effected by the method proposed by myself, as described in the preceding case. The patient was about 24 years of age. In the preceding June, at full term, and in perfect health, she was delivered of her second child by a very rapid labor, in which she had but one severe expulsive pain, and that just as the head was expelled. Until a few moments previous to delivery, she had not found it necessary to lie down. The after-pains came on at once, they were severe, and lasted longer than had been the case after the birth of her previous child. From a short time after delivery until the reduction, there had been a constant show, which frequently amounted to hemorrhage, and she presented the appearance of one who had been suffering from an excessive loss of blood. Her condition had been attributed to the existence of a polypus, which was supposed to be protruding from the os uteri, and she had been sent to the hospital to have it removed.

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[1] American Journal of the Medical Sciences, April, 1866.

After she had been etherized, Dr. Gouley, as well as Dr. Wm. H. Van Buren, concurred in the diagnosis formed by Dr. Noeggerath and myself. At my request Dr. Noeggerath, following Dr. Gouley, attempted the reduction by his method of depressing one side of the fundus into the canal and carrying this portion up first, as has been described. After an attempt of some fifteen minutes, he found it impossible to indent the body sufficiently and desisted. I passed my hand into the vagina, and for a while endeavored to put his method into practice, but found it impossible to produce any real effect. In fact, the organ was so dense, and contracted to so nearly its natural size, that the case was not a fair one in which to test his mode, nor was the inversion one which could have been reduced by pressure at the fundus, as proposed by Prof. White, while it was in every respect favorable to the method I resorted to. I passed my fingers around the portion within the os as described in the previous case. Then, with a simultaneous upward-and outward pressure, the neck was gradually dilated, until, by a forcible extension of the fingers, the seat of inversion was reached. In less than half an hour the mass, as felt through the abdominal parietes, had doubled in size, the depression in the centre had become larger, and the shape had changed from a circle to an oval. The fundus gradually passed entirely within the cervix, but, after this, the progress, as appreciated by the fingers within the uterus, was almost imperceptible, though the rapidly increasing size of the mass and diameter of the depression, at the seat of inversion, was recognized by all present. At the end of an hour, my hand in the vagina became so powerless that, without the aid of the hand over the abdomen, I was unable to feel the body of the uterus within its grasp. I finally requested Dr. Noeggerath to relieve me, and, by his continued manipulation, in about ten minutes the reduction was completed, after a conjoined effort of an hour and twenty minutes.

This woman had a rapid recovery, but I have known nothing of her history subsequent to her leaving the hospital.

Case XVIII.[1]—Mrs. C., aged 26, on the recommendation of Dr. Crispell, of Roundout, N. Y., was admitted to my private hospital,

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[1] American Journal of the Medical Sciences, Jan. 1868.

[illegible] and presented the following history. She menstruated [illegible] years of age, married at [illegible], and had been in perfect [illegible] to the birth of her child. Labor at full term com- [illegible] 22, 1865, and was terminated without artificial aid in [illegible] twenty hours, its progress having been somewhat tedious, [illegible] otherwise natural. By the next pain following the birth the [illegible] was expelled, without traction or any interference. The cord was [illegible] natural length, and not looped about the body of the child. She was attended by a physician of experience, who furnished me [illegible] with the following interesting features of the case. Before [illegible] the bandage he waited some time, and satisfied himself that [illegible] had properly contracted. As he was leaving the house he [illegible] bearing down as with an expulsive pain, but feeling satisfied [illegible] could be nothing unusual in her condition, he proceeded to [illegible] but a few hundred yards distant. He, however, felt uneasy, [illegible] almost immediate return he found that he was just being [illegible] and that there had been hemorrhage and violent [illegible] pain ever since his departure. An examination discovered a [illegible] inversion of the uterus, which he immediately reduced without [illegible] difficulty, and, with the recurrence of pain, the organ contracted [illegible]. He remained in the house for nearly three-quarters of an [illegible] afterwards, and, before leaving, satisfied himself that the uterus [illegible] properly contracted. The after-pains were slight, she made a good recovery, nursed her child, and was apparently in perfect health [illegible] thirteen months afterwards. Menstruation then returned, and at the end of five days, when it had nearly ceased, excessive hemorrhage suddenly came on. The uterus was then found completely inverted, and the fundus just within the labia. By astringent injections the hemorrhage was for the time arrested. At the end of the fifth day of the next menstrual period, the hemorrhage again occurred, and with each period afterwards would continue until arrested by astringents or the tampon. She was exceedingly anæmic, and had at all times a profuse watery discharge, with a tendency to hemorrhage on the least exertion.

A few days after her admission, with a pulse of 120, she was placed under ether, and I attempted the reduction. Drs. Peaslee, Crisp[illegible], and Perry were present. The condition of the uterus was remarkable, and it might easily have been mistaken for a polypus. The vagina was found occupied by a soft, smooth mass about the size of a hen's egg, with a distinct pedicle scarcely three-quarters of an inch in diameter, around which the cervix was well contracted. The uterine probe passed a little over two inches into the canal, and apparently to the fundus. The left hand was introduced into the vagina, and the other above the pubes, they were then approximated sufficiently around the uterus to indicate that the case was one of inversion, and from the shape of the mass and the depression in its centre, felt through the abdominal wall, there remained no question as to the true condition. Half an hour after commencing the reduction, by the method described, the cervix and canal had become so dilated that the fundus could be carried entirely within the uterine cavity, but beyond this no progress could be made in the reduction. The pedunculated portion was so small that it would double on itself in such a manner that the upward force, of so much importance at this stage, could not be fully exerted, and was lost to a great extent. Over the edge of the ring, formed by a portion which had been inverted and now but just rolled out, the broad ligament on the right side was felt thickened and dipping into the canal formed by the inversion. On turning the uterus up against the abdominal wall, by means of the hand in the vagina, this condition was recognized by all present, and as the mass could not be moved aside, it was feared that adhesions existed to an extent which could not be overcome. It was also thought that this had given rise to some impediment to the circulation, and thus brought about an atrophied condition of the body of the organ. At the end of three hours the condition of the patient became so feeble that all further attempts at reduction were for the time abandoned.

June 19. Ether was again administered, the pulse being feeble, and 140 per minute. Drs. Peaslee, Clymer, Crispell, and Perry were present. Notwithstanding that the original condition of the inversion had returned, in less than half an hour all was gained that had been accomplished by the previous effort. At the end of the first hour the pedunculated part of the body had disappeared, and the ring at the seat of the inversion had become so dilated that, by pushing up through it a portion on the right side, the finger was distinctly felt through the abdominal wall by the gentlemen present. It was now evident that the broad ligament, in a mass, was firmly adherent, and that the reduction could not be accomplished unless the ring at the seat of inversion could be dilated sufficiently to admit of the left side of the uterus being reduced first, and afterwards the opposite side by rotating it bodily around through the dilated portion, thus leaving the adhesions intact. But to accomplish this extent of dilatation was almost beyond the expanding capacity of the fingers. I continued, however, my efforts for *five hours*, occasionally being assisted, towards the close, by Drs. Peaslee and Perry, but no progress was made after the first hour, except to dilate gradually the portion below the seat of inversion to such an extent that the cervix and uterine canal became lost almost as one continuous cavity with the vagina. During the last hour the circulation became so irregular and feeble that the anæsthetic had to be abandoned, and stimulants, as well as beef-tea, freely resorted to. At length I was reluctantly forced to cease my efforts for the time, but I was determined to make another attempt, and not wishing to lose what had already been gained, I introduced rapidly five deep interrupted silver sutures into the neck of the uterus, and on twisting them drew the sides of the cervix together over the fundus, thus confining it within the uterine canal, like a ball within its cover. This was done on Wednesday; she soon rallied, and within twelve hours had regained her usual condition, still full of hope and not discouraged by the failure. She was kept in bed, and on the following Saturday, about noon, she felt something suddenly slip, as she expressed it, with immediate relief from a feeling of fulness which she had experienced since the operation. My impression at once was that the sutures had torn out, or possibly that the uterus had become reduced, but on examination the sutures were found intact, and on passing the sound between them the fundus was felt behind. I now became satisfied that the adhesions above had separated, and that I could almost promise success from the next effort at reduction. In case of failure, however, I determined to freshen the edges of the cervix, to introduce the sutures, and, by uniting the parts permanently, to secure the fundus within the uterine canal.

On the following Wednesday, a week after the previous attempt, ether was again administered and the sutures removed. The fundus immediately dropped into the vagina, while the extent of dilatation was about the same as had been gained on each previous attempt at the end of the first half hour, but the mass above, supposed to have been the broad ligament, had disappeared. After she had been examined by the gentlemen, in twenty-seven minutes from the time my hand was introduced into the vagina, about five minutes of which time were occupied in ascertaining her condition, I reduced the inverted organ unaided. Drs. Clymer and Perry were present at the time of reduction: Dr. Peaslee was also at the beginning, but was obliged to leave to see a patient, intending to return to aid me afterwards. The effect of the reduction on the circulation was remarkable, for, within half an hour afterwards, the heart's action became regular, and the pulse fell from 150 to 90 beats per minute. Her whole appearance was improved, and her lips, which had been previously bloodless, became of a natural color. Not a bad symptom supervened; she sat up at the end of a week, and returned home early in July.

Mrs. C. soon regained her usual health, but became sterile. I made an examination several years after the reduction, but found no special lesion beyond a partial double laceration of the cervix, which did not allow the parts to roll out sufficiently to necessitate an operation.

An interesting point in this case is to determine at what time after labor the inversion was reproduced. Mrs. C. for a year after her confinement was apparently in perfect health, and led an active life, while neither she nor her husband was aware of a condition which, in their marital relations, would have amounted to a positive obstruction had the inversion existed to the extent found at my first examination. After the fifth day of the first menstrual period, she was never free from backache, nor from a profuse watery discharge, until after the fundus was secured by closing the cervix; she was also liable to hemorrhage on making the slightest exertion. The attending physician satisfied himself, as has been stated, that the uterus contracted properly after he restored the organ, and I have been assured, from his professional standing, that he could scarcely have been deceived on this point. Nor is there any evidence that he may have been mistaken, for the symptoms of inversion are generally unmistakable immediately on the occurrence of the accident. Is it possible that nursing the child could have exerted an influence to the extent of keeping in abeyance, as it were, every symptom of this condition, if it existed, during the year after her delivery? And yet, while the first menstrual period was painful, it was not more so than had been frequently the case before pregnancy, nor was it increased in intensity at any time, from confinement to the first return of the menses, so that no indication is offered of the moment when the inversion probably occurred. From the data presented in the case, I confess myself entirely at a loss to offer even a speculation on the subject.

CASE XIX.[1]—Mrs. Conklin, aged 54, was admitted to the Woman's Hospital April 19, 1869, with the following history: Her general health during childhood had been delicate, and at the approach of a retarded puberty she suffered from frequent attacks of fainting, with great nervous prostration. She menstruated for the first time at eighteen, but never became regular. It was her impression that the flow had been from the first unusually painful, too frequent, and profuse. She married at thirty-five, and remained sterile. During her married life the menstrual flow became more painful and irregular, while at times she was not free from a show for more than three or four days in each month. During the same period, until a change of life took place at the age of fifty, she suffered almost constantly from a dragging pain in the back and about the hips. After the menstrual cessation her general health improved, and continued to do so for two years. During February, 1867, she contracted a severe cold, and while in the midst of a paroxysm of coughing she suddenly experienced a feeling of great discomfort in the vagina, accompanied by pain in the back and hips, which could not be localized. Her suffering became so urgent that she was obliged to seek relief from her physician. A vaginal examination was not, however, deemed necessary, but from the symptoms her suffering was attributed to "falling of the womb," for which the recumbent position and astringent injections were prescribed. Since she did not obtain relief by these means, she made a digital examination and found the vagina obstructed near the outlet by a mass which was not there a short time previous. She remained an invalid, unable to stand or exercise, with a constant vaginal discharge for fourteen months previous to her admission to the hospital.

On examination, the uterus was found inverted, with a fibro-cystic tumor situated at the fundus, which presented just within the labia. As will be seen by reference to the plate, the uterus was completely inverted on the left, while on the other side the line of the shortened cervix was defined by a shallow crescentic-shaped sulcus. The uterus was an inch and three-quarters in length, from the bottom of this fold to the attachment of the tumor at the fundus. The tumor was as large as a pigeon's egg (see Fig. 77), but had evidently undergone a reduction in size from cystic degeneration. Several large cysts existing within the mass were prominent, while on the surface were several cicatricial depressions, evidently the traces of other cysts which, in being emptied, had brought about a diminution in the size of the tumor. The mucous surface of the uterus was of a pale color, presenting in fact the same appearance as that of the vagina, and did not bleed on being handled. The arborescent configuration of its surface was well marked, and on the right side the shrivelled remains of a mucous polypus existed. The diagnosis, as to the condition of the uterus, was proved by passing the index finger into the rectum, so as to approximate the extremity of a sound felt within the bladder at a point just above the mass in the vagina, it being evident at the same time that nothing existed above the plane of the vaginal junction which could be mistaken for the body of the uterus.

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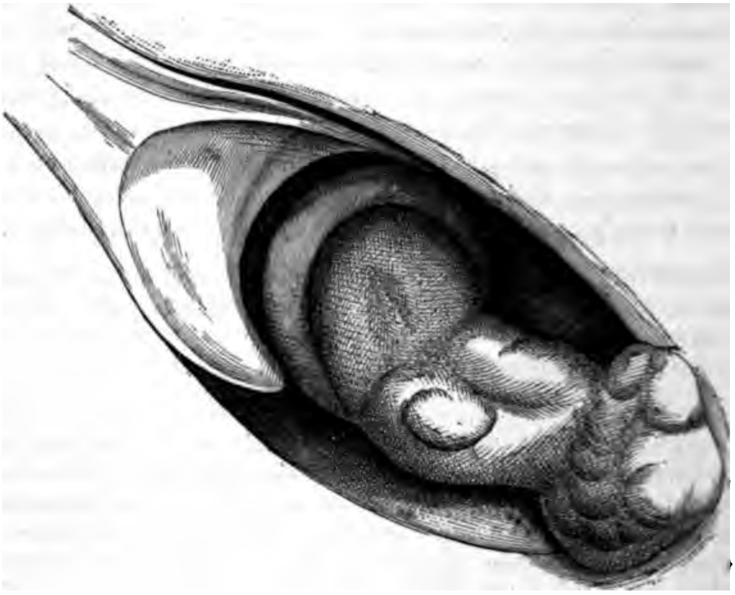
[1] The American Journal of Obstetrics, August, 1869.

Fig. 77.

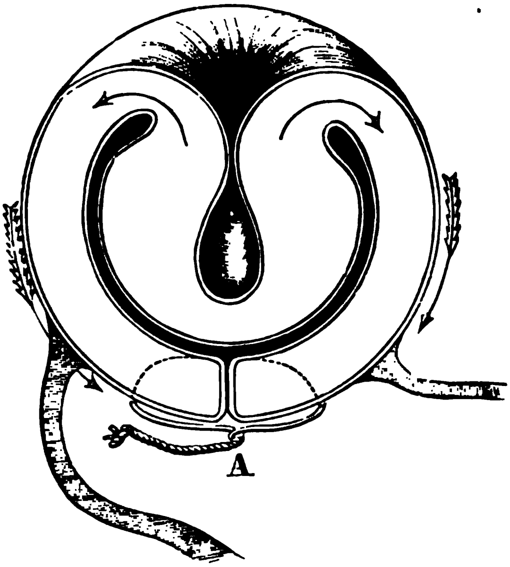


Inverted uterus, with fibro-cystic tumor. (Speculum in situ.)

May 4. A consultation was called, ether was administered, and the condition verified by Dr. George T. Elliot, one of the Consulting Board, and Drs. G. C. Nott, Trask, Swift, Perry, and others present. The écraseur was applied, and the tumor removed from the fundus with but little bleeding afterwards. It was then determined to introduce the hand into the vagina, and to reduce the inversion by the method we have been describing for the previous cases. It was found, however, impossible to introduce the hand, as the patient was obese, and had a short and narrow vagina, the result of a change of life. The uterus was therefore drawn down to the vulva, and the organ steadied by seizing the edge of the cervix on each side with a tenaculum held by an assistant. With the uterus thus fixed, a portion in advance of the vaginal junction was grasped between the thumb and forefinger of the right hand, while a steady upward pressure was made until the os uteri became well defined. The cervix was then dilated by passing the index finger around at the bottom of the sulcus, between the neck and inverted body of the uterus, while at the same time a steady upward pressure was maintained by the finger. When the fore-finger became fatigued, the body was seized with the fingers as in the beginning, and the upward pressure exerted, while the index finger of the other hand was passed into the rectum behind the organ, to relieve the strain on the tenacula, which were frequently tearing out. After three-quarters of an hour, the fundus passed within the os uteri. After persevering an hour longer, it had advanced above the plane of the vaginal junction, so that a sound could be passed within the cavity a little over an inch. From this time no advance was made, and attributing it to the fact that my fingers had become too cramped for effective service, I obtained Dr. Elliot's aid, but without his being able to make any apparent change. It now became evident that attempt at further reduction would have to be abandoned on account of the condition of the patient, and the certainty of adhesions, as suggested by Dr. Nott. This view was strengthened after a careful digital examination per rectum. It was found that the depression which had been felt at the seat of inversion, before attempting the reduction, had nearly disappeared, while in fact it should have been enlarged as the reduction advanced. Although the exact condition could not be defined, Dr. Nott's explanation seemed to be the true one, that some portion of the broad ligament had become adherent on both sides, and when the reduction had advanced so far as to roll out these surfaces to a certain point, no further advance could be made unless a separation could be brought about on one side at least. The patient had been suffering from a catarrh previous to the operation, so that it became necessary to desist in consequence of great irritability of the air passages produced by so long a continuance of the ether.

As in the previous and similar case where adhesions existed, and the procedure had proved successful in stripping them off, I introduced three deep interrupted silver sutures into the cervix. On twisting these, the sides of the os, in the middle, were brought together over the fundus. Thus the exercise of a steady force was kept up, well calculated, as we shall see, for gradually overcoming any adhesions which were not of too firm a character. Moreover, the advance already made was thus secured, so that the reduction could be again attempted under more favorable circumstances if deemed advisable. She reacted badly from the effects of the ether, vomiting afterwards, ne canal, a force is brought into play on the outside of the organ ig out the parts above, and forcing the fundus like a wedge in pward direction where the least resistance is encountered. Then, action of either the longitudinal or circular fibres of the uterus, th together, will aid in the reduction. By reference to diagram, 78, the action of these forces will be seen indicated by the direc- of the arrow-heads.

Fig. 78.



iagram showing direction of traction exerted by suture in cervix uteri after partial reduction of inversion.

at this force did not succeed in completing the reduction in one of ases (Cases XVIII.), was due, I believe, to the singularly pedunculated condition of the body. But that the force was exerted to a t degree, is proved by the fact that the adhesions of the broad ent where put on the stretch were separated by its action, although d been unable to bring this about by a continuous effort of four s. It requires, as a rule, but little time and patience to dilate the cervix and uterine canal by the method I have proposed. n, if the operation cannot be completed at the time, the fundus be secured, and the same continuous force maintained without ger to the patient.

Dr. E. H. Stephens, of Cambridge, Mass., has reported[1] a successful result where he secured the cervix with sutures over a partially reduced fundus. He had failed in the complete reduction several times, and in accomplishing anything afterwards by means of the inflated bag in the vagina. The condition of the patient at the time demanded that the attempt at reduction should be suspended. Several hours after the sutures had been introduced, severe pains came on in the lower portion of the abdomen, extending through to the back, and not unlike in character those of labor. "After lasting three-quarters of an hour, something was felt to give way inside, when all pain suddenly ceased, leaving only faintness behind." This soon subsided, and on the following day, when the sutures were removed, it was found that the inversion no longer existed.

The point I wish particularly to establish is the advantage of closing the os in cases where the inversion is thought to be irreducible, a condition, however, I am not willing to acknowledge is possible, except under very unusual circumstances. In view of this, I think it is wholly unjustifiable to amputate the inverted portion of the uterus if the fundus can be replaced within the cervix.

For this part of the operation it is necessary to denude with a pair of scissors the inner edge of the cervix, and to secure its surfaces by a number of interrupted silver sutures. Or the whipstitch may be employed, to be introduced far back from the edge and near the vaginal junction, so as to render it impossible for it to cut out before perfect union has been obtained. In Fig. 78, which represents a section of the left half of the uterus, the dotted lines show the course of a suture already twisted, but not yet bent over flat to the vaginal surface. It is not advisable that the denudation should be extended entirely around the cervical canal, but only partially, so that an opening may be left at each angle of the line for the free escape of the secretions and menstrual flow. After the operation all hemorrhage due to the inversion will cease at once. The patient will soon recover her strength, and may even become pregnant, and should this occur, nature may be relied upon to complete the reduction. The line of union at the external os would offer certainly but little obstruction to the progress of labor, for if it did not yield at the proper time, it could be readily snipped open with a pair of scissors.

Before resorting to denudation for bringing about a permanent partial closure of the os, I would advise that temporary sutures be employed. This would give an opportunity for making er attempt at reduction if nature failed to accomplish it. To iis fairly the sutures should be allowed to remain undisturbed eeks if they do not cut from too great tension. Their ends l be bent over properly, and made to lie flat to the surface, ling to the directions which have been already given.

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[1] The Boston Medical and Surgical Journal, February, 1879.

at this plan of reduction has not fully succeeded in the hands of s is due either to the fact that the different steps have not been stood, or that the attempt has been made to accomplish too much short a time. Let us briefly review the different steps and rinciple involved in the operation. By a glance at Fig. 76, l be apparent that the surfaces within the neck cannot be sepa- to any extent without rolling out the parts immediately at the f inversion. This action must necessarily, at the same time, pen the mouth of the canal now formed by the external surface e uterus, through which the inverted portion of the organ is to turned. Until the fundus has passed well within the cervix, the effort must be directed to dilating the neck by expanding the rs in an upward and outward direction. In other words, the s should be firmly grasped by all the fingers immediately below eat of inversion, and, at the instant before expanding the fingers, ressed upwards against the hand on the abdominal wall. The over the abdomen should at the same moment be making pres- downward and outward, and sliding the parietes over the portion n the cavity. The procedure must be repeated in this order the fundus can be passed entirely within the cervix. The neces- for augmenting this upward pressure increases in proportion to dvance made in the reduction, while the aid derived from ex- ing the fingers becomes proportionately lessened to the point of letion. There is still, however, a dilating force exerted by ing the fingers between the prolapsed portion and the sides of anal. For, as the uterine canal is enlarged in its lateral diameter, eduction is advanced pari passu by shortening the vertical one. no advance can be gained by main force, for it is impossible, ut rupture, for any portion to pass until the necessary dilatation een effected. It is well occasionally to alternate the pressure so it shall bear first to one side and then to the other, instead of ing the mass always in the same direction. Sometimes it should lateral motion, as in the delivery of the fœtal head by forceps. the same principle the vagina, for a moment or two at a time, ld be placed on the stretch by making steady pressure in the direction of the promontory of the sacrum. By thus changing the direction of pressure in the last stage, a portion of the mass will sometimes suddenly slip up, when a moment before it seemed wedged in and immovable. By resting the back of the hand in the hollow of the sacrum, so as to turn the organ up against the abdominal wall above the pubes, the hand of the operator is placed in a less constrained position, while at the same time the uterus is steadied, and the counter-pressure exerted by the other hand is maintained to the best advantage. Every step is to be gained by a steady and persistent effort, but without violence. Towards the close of the operation the advance of the fundus is hastened beyond question by a rapid change of assistants, so that the force may be as nearly continuous as possible, and not allowed to flag from the fatigue which must attend the prolonged efforts of any one person. We may repeat, then, that too much must not be attempted at first, for until the vagina has become somewhat dilated, and the hand of the operator accustomed to the manipulation, what was accomplished in the beginning will be to a great extent lost, in consequence of his hand becoming cramped and almost powerless. The operator must learn to husband his strength until the fundus can be passed within the cervix, when it can be made available to the greatest advantage. Finally, as long as the etherization is well borne by the patient, no case must be despaired of in consequence of the apparent want of progress, for at any instant the reduction may be suddenly completed.

Dr. E. S. Lewis, of New Orleans, has reported[1] a case where the method I have recommended was successfully applied in the reduction after other means had failed.

The case was admitted to the Charity Hospital, New Orleans, March 6, 1879, at 22 years of age. She had been delivered of her first child Dec. 6, 1878, and since then had suffered from frequent loss of blood. For six days after her admission the vagina was distended by means of an India-rubber bag filled with water, in the expectation of effecting the reduction by continued pressure. Then Courty's, and afterwards Noeggerath's, method was tried without success. The vagina was again distended for several days, and afterwards Courty's method was employed for a second time, while the patient was fully under the influence of chloroform, but without producing the slightest impression on the condition of the uterus. On another occasion, steady pressure was kept up against the fundus by means of White's repositor, but with no better success.

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[1] Chronic Inversion of the Uterus of Five Months' Duration, Reduced by Emmet's Method, New Orleans Med. Journal, Oct. 1879.

April 23. "Emmet's method" was employed for an hour and a half, when the fundus was gotten past the internal os. The elastic bag was then resorted to for the purpose of retaining the fundus within the canal, and for a time during the absence of Dr. Lewis from the city.

May 13. On removing the bag it was found that no change had taken place "beyond a greater softness of the uterus." The same method was resorted to with the effect that at the end of two hours the reduction was complete, "excepting a part of the fundus which formed a projection in the cavity opposite the left horn of the uterus." This was reduced by a "cup-shaped stem pessary" attached to an elastic tubing, which connected with an abdominal belt. This contrivance was removed on the following day, the reduction was complete and the uterine canal was three inches in depth. She was discharged May 21, and had remained well up to the time of reporting the case.

I must repeat the advice already given that under similar circumstances, where the fundus had so far advanced within the canal, the cervix should be closed over it with sutures, as a resource presenting the least risk.

Notwithstanding all due care be taken, as was done in this case, to remove frequently the elastic bag and to wash out the vagina, the procedure must always be attended with danger. The plan of distending the vagina with a bag filled with air or water is one scarcely worthy of reference in comparison with other means at command. It is one which almost always produces a great deal of disturbance, often causes cellulitis, and it is doubtful if the method is ever successful when employed alone. It has certainly proved in my experience a useless waste of time at least, if no other disadvantage followed its use. When the pressure, however, is limited, and applied directly to the fundus, it is claimed that the results have often been most satisfactory.

Dr. Clifton E. Wing, of Boston, reported to the Suffolk Medical Society, Nov. 29, 1879, and afterwards printed for private distribution, a case of complete inversion of the uterus, which was reduced fourteen months after the confinement, by means of continued moderate pressure, without the aid of anæsthesia. Dr. Wing points out the difference of action between pressure made on the fundus by distending the vagina, and that exerted by steady pressure applied to the fundus uteri.

In the previous edition of this work no reference was made directly to this mode, from the fact that this difference of action had not been appreciated, and because all efforts, within my personal knowledge at reduction without the aid of direct manipulation, had uniformly proved useless.

Dr. Wing writes: "The value of *continued gentle pressure* in the treatment of inversio uteri seems to have been but little appreciated by the profession at large, although its merits have been sufficiently proved by the successful cases which have been from time to time reported, particularly in Great Britain." In a foot-note he refers to a case reported by Dr. Geo. G. Tarbell in the *Boston Med. and Surg. Journ.*, Jan. [illegible], where continued gentle pressure proved successful after other means had failed. This, he states, was one of the earliest cases treated by this method, and that Dr. Tarbell had another successful case not long afterwards.

Dr. Wing describes the action in the following manner: "It is a well-known physiological fact that the strongest muscle, which would be powerful enough to resist great force applied for a comparatively short time, can yet be completely overcome and thoroughly stretched by the continued application of very little force. Now the whole uterus, and therefore, of course, that portion of it which in the given cases constitutes the impediment to reposition, is to all intents and purposes a muscle, a muscle strong enough to successfully resist in many cases the force applied in taxis—a force which can be applied but a little while at a time, and which moreover is often not very great, since the hand of the operator works at a great disadvantage and soon tires—but which cannot withstand the action of *long-continued* pressure upon the fundus, even when the *amount* of pressure is but slight."

The case was prepared by using hot water vaginal injections, and with a very satisfactory result in lessening the congestion and sensibility of the uterus. Being unable to obtain the "stem and cup" described by Barnes, he made use of an old-fashioned wooden stethoscope, over the large end of which he tied some sheet India-rubber. This end was applied to the fundus and the other projected from the vulva. The pressure, as in Dr. Lewis's case, was obtained by means of two pieces of elastic tubing passed between the thighs, where they were tied to the projecting portion of the stethoscope, and the end in front and back was attached to a waistband. Dr. Wing found that he could not only control the amount of pressure, but also the direction of the force, by regulating these bands. He afterwards changed for a solid wooden instrument, of the same shape, but with a very shallow depression for the fundus, as the edges of the stethoscope had begun to cut into the tissues. On the evening of the second day a considerable advance had been made in the reduction; the instrument was removed so that the smaller end could pass into the uterine cavity. During the night of the third day she was waked up by feeling "something jump inside." On the following day it was found that the reduction had been completed, and the canal was less than four inches in depth.

The instrument had been removed daily and cleansed, and at the same time the vagina had been well washed out. There had been but little disturbance; an anodyne was administered but once. She made a good recovery, and was out in five days.

The number of cases must be exceedingly small in which it is impossible to restore an inverted uterus by some one of the different methods which have been detailed. But granting that reduction is impossible for some, I hold that the number is still smaller where, with proper manipulation, the fundus cannot be gotten within the cervix, so that it may be retained there permanently if necessary.

If nothing more can be accomplished than a partial reduction with the retention of the fundus, this condition is certainly preferable to the danger attending extirpation of the uterus. From the experience gained in the two cases under observation, it is evident that this partial restoration is sufficient to arrest the hemorrhage. It is also shown that the position will restore the circulation in the uterus sufficiently to check the excessive secretion, so that a restoration to health may take place afterwards. By leaving an opening at the time of the operation, menstruation will continue unobstructed, and if, by chance, pregnancy should occur, complete restoration would no doubt be brought about.

It is possible that a failure may occur to secure a partial reduction, as was the case with Dr. Thomas after fourteen attempts at taxis had been made by himself and others. When the fundus cannot be secured within the cervix, the choice will present itself between amputation of the inverted portion, opening the abdominal wall and attempting the reduction from above, or of abandoning the case. Were the risk of life to the patient no greater than that from ovariotomy at the present day, I should favor as a last resort the abdominal section as suggested by Dr. Thomas. But the danger is doubtless greater, since the peritoneum after long pressure from an ovarian tumor would be in a very different condition and less liable to inflammation. Yet it is possible that, by the aid of Lister's method, the risk of life may be lessened. But with our present knowledge I would not advocate the operation unless the life of the patient was in jeopardy, and the choice rested between it and amputation.

Notwithstanding I have known three cases of amputation of the uterus in the practice of others to recover, yet I would not resort to the operation under any circumstances. Dr. West[1] cites twelve deaths in fifty cases, or rather forty-eight, since in two the operation was abandoned. In a report from a German source, in the American Journal of Obstetrics for August, 1868, eighteen deaths are stated as occurring among fifty-eight amputations of inverted uteri. In one hundred and six cases of amputation by ligature and otherwise, over thirty-one per cent. of deaths occurred. Schroeder[2] gives us the following: "Adding some more recent cases to the statistics of Scanzoni, we have the following results:"—

	Total.	Recovering.	Death.
Simple removal	14	6 (43 per cent.)	8 (57 per cent.)
Simple ligature	26	19 (73 per cent.)	7 (27 per cent.)
Ligature and removal . . .	29	24 (83 per cent.)	5 (17 per cent.)

Dr. Thomas saved one case and the other died, yet we can make no true estimate of the actual risk from so small a number. But if the mortality from amputation should prove even no greater than that given above, the risk of life is too great. Then, apart from the danger of amputation, there is the additional disadvantage that, if the woman escapes with her life, she is left mutilated to contend with the consequences of imperfect menstruation.

In contrast to this might be mentioned the remarkable degree of immunity from danger attending the most prolonged attempts at reduction by taxis and other means. I have met with but two instances on record where death resulted from attempts at reduction, and these would, doubtless, have been less likely to occur at the present day with our enlarged experience. Under ordinary circumstances by the use of astringent vaginal injections, and by rest at the time of the flow, the tendency to hemorrhage can be kept in check, with almost a certainty of its cessation after a change of life.

One point seems to be fully established, viz., that amputation by the ligature alone should never be attempted, since the danger of peritonitis and blood-poisoning is greater by that than by any other method. The best results have been obtained by the temporary use of a wire ligature, which is to be gradually tightened by twisting. After a few days, before sloughing begins, the body of the uterus may be removed by the écraseur, scissors, or the wire cautery, but at a sufficient distance from the ligature to leave a good stump in case of bleeding. The wire ligature may then be carefully loosened, and removed if there should be no hemorrhage. Another plan is to remove the greater portion of the mass by means of scissors, and then continue to tighten the wire for a few days, by twisting, until it cuts through. In this case it is essential to guard against blood-poisoning, by applying strong carbolic acid to the stump at the time of removal. It is necessary to tighten the wire loop gradually, since less pain and constitutional disturbance are likely to result than if it were done rapidly. The pain is explained by Dr. Barnes to be due to compression of the Fallopian tubes, both of which are dragged into the new canal formed by the inversion. The object of using the ligature for several days before removing the mass, is to bring about, if possible, adhesion between the peritoneal surfaces lining the canal, and thus to close the opening which would otherwise be left in the peritoneal cavity. Another object, and a most important one, is to cause a clot to form and plug the two large vessels running along the upper border of the broad ligaments, from which there is always great danger of fatal hemorrhage. It is always necessary for the comfort of the patient, to keep her fully under the influence of opium until the mass separates, and to guard against blood-poisoning by the frequent use of vaginal injections of warm water, to which has been added brewer's yeast, or a little carbolic acid.

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[1] Lectures on the Diseases of Women, London edition, p. 240.

[2] Ziemssen's Cyclopædia, vol. x., American edition, p. 221.

CHAPTER XXII.

SUB-INVOLUTION OF THE UTERUS.

THIS condition, together with its causes, has been considered at some length under the head of general principles. It was then treated of as a consequence of faulty nutrition, where from some cause the removal of the old material, consequent upon the pregnancy, had been arrested.

While admitting that frequently this process is stopped or retarded alone through faulty nutrition, we were yet inclined to believe that in a far greater proportion of cases both the sub-involution and faulty nutrition were the effect of a common cause. It is believed that future observation will establish the fact that, as a rule, the involution is first stayed, and then faulty nutrition occurs as a consequence of some injury received during the progress of labor. To the occurrence of laceration of the cervix, and to the formation of cicatricial tissue in the vagina, and to the displacements of the uterus, by all of which the circulation would be obstructed, we must, in most cases, attribute the continuance of an enlargement of the uterus long after a sufficient time has elapsed since the delivery for a return to its normal size. Since each of these conditions is specially treated of under its appropriate head, their further consideration is not called for in connection with sub-involution.

Wherever we find an instance of this enlargement of the uterus remaining after childbirth, and without any apparent cause, as the reception of an injury, we must examine with the greatest care into the state of the general system. When this is at fault we will find a want of tone in the pelvic venous circulation. Our remedies are to be particularly selected with the view of improving the general tone, or, in other words, nutrition. This is to be accomplished by more nutritious food, a change of air when possible, or, if the patient is obliged to remain at home, she should be constantly in the open air and in the sunlight. In this condition, as in others where the digestion is feeble, we must determine what quantity of food or of any remedy can be readily taken up by the stomach without causing di turbance. It is, therefore, a question, not as to the quantity or quality which can be put into the stomach, but as to just how much can be thoroughly digested. Where cod-liver oil can be tolerated, much benefit may be expected from its use. The continued use of small doses of ergot is advisable for its effect on the coats of the vessels; it should not be administered by the stomach for fear of disturbing digestion, but by the daily injection of a sufficient quantity of the fluid extract into the rectum. The hot-water vaginal injections are also to be employed at least once a day. We will find, as a rule, feeble respiration in both lungs, with an increase of secretion throughout the air-passages, the condition being the one best fitted for the rapid development of tubercles. There will necessarily exist a certain degree of prolapse from the increased weight of the uterus. This must entail more or less discomfort, and render the patient incapable of taking the requisite amount of exercise. It becomes, then, a necessary step to fit a pessary which will lift the uterus to its proper position in the pelvis, so that its circulation may be unobstructed. When this is accomplished, and there is an improvement in the general health, the old effete material will be gradually removed, and the uterus will, in a corresponding degree, return to its natural size. But by far the best means for bringing about this condition is an entire change of scene and climate. We often find existing with the state of sub-involution follicular disease of the throat, and a more or less diseased condition of the mucous membranes throughout the body. This perverted state of the mucous membranes is, equally with sub-involution, an indication of some serious defect in nutrition. When these two symptoms coexist, the necessity is the more urgent for a temporary change of air, and the selection should be made with the view of obtaining a dry and mild climate, in which the patient should pass the winter.

In closing this brief chapter I would state that, for many years past, I have met with few or no cases of sub-involution which were not due to laceration of the cervix.

CHAPTER XXIII.

LACERATION OF THE CERVIX UTERI.

History—Etiology—Tables XXXIII. to XXXVII. inclusive, being analyses of lacerations—Influence on menstruation.

During the autumn of 1862, I accidentally recognized the importance of this lesion, and at once instituted a surgical procedure for its relief. The operation then devised has stood the only true test, that of time, and has been but little modified. From the above date, I have continued to operate frequently in both public and private practice.

Feb. 8, 1869, I described the operation fully in a paper[1] read before the Medical Society of the County of New York. Before the same Society, on Sept. 28, 1874, I presented an article[2] on "Lacerations of the Cervix Uteri as a frequent and unrecognized cause of disease." This last paper was soon after translated by Dr. M. Vogel, and published in Berlin, June, 1875. Prof. Breisky, in the following year, published a favorable criticism[3] on the paper translated by Dr. Vogel, together with the report of fourteen cases successfully treated by him.

After finding that some of the views presented in my previous paper had not been fully understood by the profession, I read another article on "The Proper Treatment for Lacerations of the Cervix," before the County Medical Society, early in December, 1876, which was afterwards published.[4] This last article, with the previous one, was soon after published by Dr. Vogel,[5] together with a preface by Dr. Breisky.

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[1] "Surgery of the Cervix," American Journal of Obstetrics, Feb. 1869.

[2] American Journal of Obstetrics, Nov. 1874.

[3] Zur Würdigung des Narbenektropiums des Muttermundes, und dessen Operatives Behandlung nach Emmet, von Prof. Breisky in Prag. Wiener Med. Wochenschrift, No. 49, bis, 51, 1876.

[4] American Practitioner, Indianapolis, Ind., Jan. 1877.

[5] "Risse des cervix uteri als eine häufige und nicht erkannte Krankheitsursache und die Behandlung des Risse des cervix uteri. Zwei Schriften von Dr. Thos. Addis Emmet," etc. Uebersetzt von Dr. M. Vogel, mit einem Vorwort von Prof. Breisky in Prag. Berlin, 1878.

I quote from Prof. Breisky's paper upon Cicatricial Ectropium. 'German gynæcological literature took no notice, to my knowledge, before the appearance of the translation by Dr. M. Vogel, published last year as a brochure, of a very remarkable paper read by Dr. T. A. Emmet before the Medical Society of the County of New York, upon Lacerations of the Cervix Uteri," etc. "He describes the cicatricial ectropium of the os uteri known to us through Roser (*Archiv für Heilkunde*, II Jahrgang Heft, Leipzig, O. Wigand, 76, No. 298), and for the first time established its pathological significance as well as its treatment. That to Emmet, in fact, belongs this essential share in the question, follows indubitably from a consideration of Roser's treatise. While Roser, in describing his two forms of ectropium, one of which originates through cicatricial distortion, the other by the crowding forward and swelling of the mucous membrane, chiefly concerned himself with the latter form, and with the correction of Lisfranc's interpretation of this condition as 'granulation' of the mouth of the womb, he devotes only a few words to the cicatricial ectropium, which he does not regard as frequent. Roser indicates as its cause excessive fissures, also probably obstetrical incisions and gangrenous destruction of the mouth of the womb." "Roser discusses the inflammatory ectropium described by him in detail, also with regard to its therapeutics, in a searching manner, and observes, among other things, '*Many cases of obstinate and inveterate hypertrophy of the lowest part of the uterine mucous membrane may be considered as incurable*, since retrograde metamorphosis, shrinking, and atrophy do not take place, and an entire excision of this part, from the slight significance of the lesion (in many cases to be regarded as almost nothing) is not to be recommended.' Roser manifestly did not give any higher significance to the cicatricial ectropium, for he says '*in the cicatricial ectropium of the uterine mucous membrane one will scarcely be prompted to undertake a curative experiment.*' This is all that was known upon the subject before Emmet's treatise." "Accordingly, we undoubtedly owe to Roser the first anatomical and etiological exposition of cicatricial ectropium; to Emmet, however, on the other hand, remains the priority of having appreciated and taught a knowledge of the clinical significance and the successful surgical treatment of this affection."

From Roser's description it seems evident that he only referred to the condition where a fissure is left after a laceration of the cervix. This result every one would easily recognize, but until recently no one attached any more importance to the lesion than he did. But by far the most frequent, as well as the most important condition, and the one easiest relieved, he certainly did not appreciate. After the parts have been torn and while they are soft enough to be flattened out by pressure on the floor of the pelvis, there remains no evidence of the laceration, and the true condition frequently cannot be detected by either the sight or by the sense of touch. Roser had not even an appreciation of the causes at work in producing the condition he has described. This is evident from his use of the term "cicatricial ectropium," since the formation of cicatricial tissue is only an incident. Prof. Breisky, in his preface to Dr. Vogel's translation, quotes from my letter to him; "I must take exception to the term 'cicatricial ectropium' as not being the true pathology. There can be no cicatricial tissue formed except on the surfaces lacerated, and if this tissue contracts, it would have the effect of rolling in the parts instead of what does occur. When the condition is produced on the lower eyelid, the mucous membrane is not exposed from cicatricial tissue on this surface, but from the cicatricial tissue on the skin outside causing the traction. The flaps in the cervix are first rolled out, or forced apart from the large uterus resting on the floor of the pelvis, and this is increased as the circulation becomes obstructed, and as the mucous follicles undergo cystic degeneration. The condition at length becomes one of partial strangulation, as in paraphimosis. When nature attempts to fill up the angle by cicatricial tissue, the parts are prevented from rolling out, and we then have the fissure left."

Dr. E. C. Dudley, of Chicago, and formerly attached to the Woman's Hospital, was the first to designate the operation Trachelorrhaphy (N. Y. Med. Journ., Jan. 1878).

Dr. Paul F. Mundé (Am. Journ. of Obstetrics, Jan. 1879) has given an excellent article on the indications for the operation in laceration of the cervix uteri, together with a number of colored representations of the different forms of the injury. Dr. Mundé has been more explicit than Dr. Dudley in Hystero-Trachelorrhaphy.

It would be but human nature for the uninitiated to dread the severity of an operation so termed, and I should prefer to use the English expression.

Ætiology of Lacerations of the Cervix Uteri.—Previous to collecting the statistical material for this work, I had recognized and treated two hundred and nineteen cases of lacerations of the cervix in my private hospital. This shows that a little over sixteen per cent. of all women who had passed under my observation, and had been impregnated, were found to have had laceration of the cervix. This rtion will seem to many a large one, and yet, as the record ls over thirteen years, doubtless many cases during that period not recognized. It was fully six years after my first operation I had gained experience enough to detect this lesion under its l forms, while the treatment itself was not perfected until several later.

arrive at more definite results as to the frequency of this , I have taken from my case books the records of the last five ed fruitful women coming under my care in private practice. esult is reached that 32.80 per cent. of all women under obser-., who had been impregnated, and had suffered from some form rine disease, were found to have laceration of the cervix. It is, ırse, possible that this increase in the percentage is due in a re, but not wholly, to the fact that cases were sent to me by al practitioners ; but in few instances had there been a diagnosis

average age at puberty for women who had lacerations was, l be seen by Table XXXIII., 14 years, and at marriage 21.47 . These averages approximate so closely to those of all women observation, that it is evident neither the time of puberty nor of ıge had any bearing on the cause of the lesion. These women ame under my observation at about the average age of thirty-years and four months, the greatest deviation being for those ad suffered from backward laceration. While the number of is too small to give any importance to the circumstance, it is tirely an accidental one, since it is a form of laceration which produce the least disturbance, and then only later in life as the becomes changed in shape. In one of the columns of the table e found the number of the different forms of laceration, and elative frequency. It will be seen that the injury on the left the most common, and double laceration the next. To establish ome degree of accuracy the character of the labor most likely ılt in laceration of the cervix, would be an important advance. avored with great care to ascertain from each of these women ominent features of the labor in which it was supposed the nt occurred. Notwithstanding I had so intelligent a class to ith, I feel that the information gained is to be accepted only as imating to the truth. The testimony of a patient as to her , and particularly the first one, to be of value, must be confirmed eful observation on the part of the attending physician. From ri inference I had been prepared to learn that rapid labor was

TABLE XXXIII.—*Seat of Lacerations of the Cervix Uteri.*

	Average ages at			Total number for each lesion.	Percentage for each lesion.	Character of the labor when injured, and mode of delivery.									Since last pregnancy, in years.
	Puberty.	Marriage.	First consultation.			Natural.	Rapid.	Tedious.	Forceps.	Turning.	Craniotomy.	Large children.	Miscarriages.	Criminal abortion	
To the left side	14.00	21.26	31.98	67	40.85	2	21	23	10	4	....	6	....	1	4.80
To the right side	13.78	21.52	33.60	23	14.02	2	5	5	4	....	....	5	1	1	5.30
Through both sides. . . .	14.00	21.04	34.62	50	30.48	9	7	17	6	4	....	2	....	5	5.91
Backward	15.00	22.25	42.50	4	2.38	2	1	1	....	....	....	....	....	....	10.50
Circular	13.81	21.60	30.81	11	6.09	2	3	4	....	....	1	....	....	1	4.21
Not stated.	14.44	21.44	33.33	9	5.48	4	1	....	....	1	....	....	1	2	2.97
Total number . . .	....	....	....	164	....	21	38	50	20	9	1	13	2	10	
Average or percentage	14.00	21.47	33.32	....	....	12.74	22.56	30.48	12.19	5.18	.60	7.92	1.21	6.09	5.21

the most common cause of laceration of the cervix. The contrary, however, has proved to be the case, as more than thirty per cent. of the lacerations were attributed to tedious labor. This proportion would be greatly increased by the addition of the forceps cases, which properly should be placed under the head of tedious labor, since, we may assume, forceps were only employed for delivery after the labor had been prolonged. It will be noted that two instances of laceration occurred from miscarriage, and ten as a consequence of criminal abortion. Since my attention has been directed to this subject, I have found the cervix lacerated in every intance where the patient admitted the fact of exposure to malpractice. And my suspicions have been verified several times by the patient acknowledging the charge which I felt justified in making whenever I detected a laceration produced by discharge of the uterine contents before full term. It can readily be understood that laceration of the cervix would occur under these circumstances as well as in rapid labor where the parts are so quickly dilated; but as the result of a tedious labor, it is not so clear, since sloughing would then be a more likely consequence. If the delay was in the first stage of labor, with the os tardy in dilating, a condition of the soft parts might be established which would readily admit of the occurrence of this accident. But, as a rule the effect of a tedious labor would scarcely be asserted until long after full dilatation of the cervix had been accomplished. I cannot divest myself of the conviction that rapid labor will be found, on further observation, to be a far more important factor in causing this lesion than has been indicated by this record. The proportion of rapid labors, as given, is much more likely to be correct than the contrary. For it is a very natural error for a woman to exaggerate the time, and to regard a labor as tedious, although it may have been a natural one in every repect.

Observations must determine what part meddlesome midwifery plays in producing this accident. The practice of rubbing the finger around the os to excite contraction, and of stripping back the cervix from the head, with the view of facilitating the progress of labor, may be pernicious; but the consequences of any such interference must be very limited, since the history of many well-marked cases shows that labor was terminated before the arrival of the physician.

This lesion is found as frequently among the well-to-do, who have every advantage of competent medical attendance, as among the poor. Of those from whom the material we have been considering was obtained, all were treated in my private practice. They were from all parts of the United States, and were, without exception, able to command the best professional skill in their neighborhood. I have employed every means at my command to settle this point, and my conclusion is to the effect that in no one station of life is the woman more liable to this accident than in another, provided the cases of instrumental delivery are excluded. When laceration does occur from delivery by forceps, among the poorer classes, it is almost always double, and I have seen, at the Woman's Hospital, an extent of injury never met with in private practice. Upon consulting the records of the physicians attending these cases, it is evident that there are some who, with a view to saving time, are in the habit on their arrival of delivering by forceps, without apparently the slightest reference to the stage of labor. There can be no doubt of the fact that among the poor, in this city at least, the forceps are employed to a greater extent than would be permitted among the wealthier classes. As the more frequent victims of this mode of practice, lacerations of the cervix should be more commonly met with among the poor of the large cities, but the proportion is not greater than for those from the smaller towns or country.

We will now complete the consideration of Table XXXIII. by reference to the last column, in which is recorded the average duration, or the interval, since the last pregnancy. The average length of time in all forms of laceration was found to be rather more than five years. The relative duration of this interval, with respect to any one special form of laceration, is not sufficiently marked for comment. with the single exception of the backward lacerations. In this form the state of quasi sterility had existed for twice the length of time given for any other form of the injury. The proportion of these cases, as we have already noted, is smaller than any other, but the sterility was naturally produced by the greater or less degree of retroversion, which existed as a result of the laceration extending into the posterior cul-de-sac, and causing contraction of the parts or tissues located posteriorly.

Table XXXIV. exhibits the number of impregnations taking place previous to the reception of the injury. One hundred and thirty-eight women bore 407 children, and never miscarried. Eighteen had 79 children, and 34 miscarriages. Five had miscarriages alone, and three had criminal abortions produced, which caused laceration of the cervix. One hundred and sixty-four women were impregnated 528 times before the occurrence of laceration, which gives an average of 3.21 impregnations for each woman. The next division of the table

TABLE XXXIV.—*Showing the number of Impregnations previous and subsequent to the reception of the Injury.*

	Number of women.	Children.	Miscarriages.	Miscarriages alone.	Criminal abortions.	Total No. of pregnancies.
Impregnations before the injury, resulting in—						
Children alone	138	407	....	....	....	407
Both children and miscarriages	18	79	34	....	....	113
Miscarriages alone	5	....	....	5	....	5
Criminal abortions	3	....	....	....	3	3
Number of women and pregnancies before injury . .	164	....	....	....	....	528
Impregnations after the injury, resulting in, as supposed—						
Children alone	17	20	....	....	....	20
Both children and miscarriages	4	8	8	....	....	16
Miscarriages alone	24	....	....	37	....	37
Criminal abortions	2	....	....	....	7	7
Number of women and pregnancies after injury . .	47	....	....	....	....	80
Summary—						
Children alone	....	427	....	....	....	427
Both children and miscarriages	....	87	42	....	....	129
Miscarriages alone	....	....	....	42	....	42
Criminal abortions	....	....	....	....	10	10
Total number of women and impregnations	164	514	42	42	10	608

is formed from the statement of the patients as to the number of impregnations *they supposed* had taken place *after* the occurrence of the injury. This is only valuable in showing that 71.34 per cent. at least remained sterile, while there is no proof that a single case became impregnated after the occurrence of the laceration. The last portion of the table gives the total number of impregnations, and shows that 164 women were delivered of 514 children, and had 84 miscarriages; and 5 women had been subjected to 10 criminal abortions. This would furnish an average of 3.18 children for each woman, which is almost identically the same as the average number of children borne by all the women under observation. If the number of children and miscarriages, that is, if the whole number of im-

TABLE XXXV. *Showing Seat of Laceration in* [illegible]

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
On the right side	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
On the left side	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
On both sides	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Backward	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Not stated	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Not stated, perineum also lacerated	[illegible]	[illegible]	11 [illegible]	[illegible]	2 [illegible]	5 [illegible]	10 [illegible]
Not stated, perineum also lacerated and uterus retroverted	4 4.00	10 6.70 [illegible]	15 5.93	8 [illegible]	3 2.00 1 3.03	12 5.25	27 5.62
Total	27 4.44 4 [illegible] 8 [illegible]	61 5.81 19 [illegible] 18 [illegible]	137 5.10	49 [illegible] 6 [illegible] 3 [illegible]	21 2.28 3 [illegible]	[illegible]	[illegible]
Percentage	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

pregnations be taken, the average would be 3.70 for each woman, a proportion greater than that for all women passing under my observation, without reference to this lesion.

Menstrual Changes.—The average duration at puberty of the menstrual flow for the 164 women who suffered from laceration of the cervix was 4.78 days, while that on the general average for 2080 women was 4.82 days. These averages are essentially the same, and, as there was no marked difference in the early history of menstruation, either as to the degree of pain or regularity, it is evident the condition at puberty would furnish no indication of subsequent liability to this lesion.

It will, however, be of importance to study the subsequent changes in menstruation, as brought about by laceration of the cervix.

Table XXXV. shows the subsequent changes in duration of the menstrual flow in 219 cases of laceration of the cervix. We there see that but 17.80 per cent. of this number continued after the injury without change in the menstrual flow from what it was after puberty. This proportion was obtained from those who remained in after life normal, too free, or scanty in the flow, but in whom there had been no change in consequence of the injury. The same table, however, shows that with only 12.33 per cent. was the menstrual flow normal in after life.

TABLE XXXVI.—*Epitome of Changes in the Duration of the Menstrual Flow in* 130 *cases of Laceration of the Cervix.*

Number of cases with the flow increased or lessened.	Changes in duration of menstrual flow.	In days.		Percentage	
		From	To	On the changes.	On the total number.
		As to puberty	In after-life.		
82	Increased . . .	4.68	7.07	63.07	50.00
48	Lessened . . .	5.16	3.56	36.92	29.26
130	Changed . . .	4.86	5.70	....	79.26

Table XXXVI. shows that 130 women, or 79.26 per cent. of the 164 cases with laceration, had the flow increased or lessened in duration or amount in consequence of the injury. Eighty-two women had the flow increased from 4.68 days, as it was at puberty, to 7.07 days in after life. This number is there shown to be 63.07 per cent. of 130 cases with whom a change took place, or 50 per cent. of the total number with laceration, who had the flow increased in quantity. I can offer no explanation for the circumstance where we find the average length of the menstruation at puberty is so much greater for the forty-eight women, with whom the flow became lessened in after life, than for those who had it increased. It would have been natural to anticipate the opposite effect.

We find at puberty the average length of the menstrual flow for these 130 women was 4.86 days. On taking the average for these women in after life, without regard to any change taking place in the increase or lessening of the flow, it will be found to be 5.70 days, thus showing that the general effect of the injury is to increase in after life the length of the menstrual flow by an average of nearly one day.

Table XXXV. may be considered in two portions. The first includes 137 women with whom the length of menstruation remained unchanged, or 62.55 per cent. of the total number. These are again subdivided: the first subsection is made up of 39 women in whom the flow, after the accident, remained unchanged as to time and quantity, or 17.80 per cent. of the total number. The second subsection consists of 98 women, constituting 44.74 per cent. of the whole number of lacerations. With these the length of flow remained unchanged, but the quantity increased, lessened, or became irregular. It may, therefore, be stated, that of the 137 women with whom the time remained unchanged, 28.46 per cent. continued to be normal, too free, or scanty, as they had been from puberty, while 71.53 per cent. had the quantity altered.

The second section is formed of 82 women who constituted 37.44 per cent. of the total number; with these both time and quantity had undergone a change after laceration of the cervix. Two subdivisions are also made here: in 26.48 per cent. the length of period became increased, and in 10.95 per cent. lessened. Again, of those with whom the time became changed, it was lengthened with 70.73 per cent., and lessened in 29.26 per cent. without reference to changes in quantity. The number of menstrual days is given for each condition, but in this respect the information is of limited value except for lacerations as a class, since for so large a proportion the locality of the injury had not been noted.

In conclusion of this subject a brief study of Table XXXVII. will prove of interest. Here we have the condition as to quantity treated of without reference to the length of the menstrual flow, the average duration for each condition being given merely as a coincidence. To reach the results for each condition shown by this table, we found first the number of cases, then the total number of menstrual days, afterwards the average duration of flow, and finally the proportions. But on making a comparison with Table XXXVI. it must be borne in mind that the two tables not only treat of different sets of cases, but that one records the effect of the injury on the length of menstruation, while the other treats of the quantity. For example: a woman may have had the length of the menstrual flow doubled, and yet the aggregate quantity may have been lessened. Again, the converse may be true, the duration of flow being shortened, and the quantity increased. With this explanation any apparent discrepancy will be understood. One fact is made prominent by comparison between these two tables, viz., that the causes of a lengthening of the time of the menstrual flow and an increase in quantity, are almost identical. The connection between a shortening of the time and a diminution in quantity, is almost as well marked, but the other conditions, in their relation to time and quantity, do not seem governed by any obvious law.

TABLE XXXVII.—*Epitome of Condition as to the Quantity of the Menstrual Flow in 219 cases of Laceration of the Cervix.*

Condition of Menstruation.	Number of cases.	Total number of menstrual days.	Average length of period.	Average for each condition.
Remaining as before the injury, being				
Normal	27	120	4.44	12.32
Too free	4	32	8.00	1.83
Scanty	8	23	2.87	3.65
Changing after the injury, being				
Increased	113	734	6.49	51.59
Lessened	46	179	3.84	21.00
Irregular	21	115	5.47	9.58
Total	219	1203	5.49	

Differences in quantity are, as a rule, to be attributed to the date of the accident, and conditions of the surfaces afterwards. Whenever the laceration has been somewhat recent, the flow will be the more profuse or irregular. But if the injury has been one of long standing, so that the mucous membrane has undergone extensive cystic degeneration, and atrophy has already begun, the flow will become less in quantity, and also irregular. That the menstrual flow should remain unchanged in a certain proportion of cases, can only be explained on the ground of a difference in the extent of injury.

The occurrence of cellulitis in connection with, or as a consequence of, laceration of the cervix is the most important as it is the most frequent complication. Although a large number of cases of cellulitis were recorded in connection with those forming Table II., I will, for the reasons already given, confine myself to the material furnished from the histories of the 164 women which were the last under observation.

Of these 33, or 20.12 per cent. of the total number, had cellulitis at the time of their first examination. It would, of course, be impossible to estimate what the proportion was of those who had recovered from an attack of cellulitis in the interval, since an average of over five years had elapsed between the birth of the last child and my first examination.

Eleven women, or 33.33 per cent. of all having cellulitis when first seen, had the menstrual flow increased; 16, or 48.48 per cent. had it lessened; while 6 women, or 18.17 per cent., suffered no change after the reception of the injury. Where the duration of the flow had been lengthened, the average increase was from 4.36 days, at puberty, to 6.63 days after the injury, while with a larger number the period was lessened from 5.50 days to 4.12 days. The average length of menstruation for the total number of those women who had cellulitis was 5.03 days at puberty, and but 5.14 days in after life, if the average be taken without regard to changes.

The unexplained circumstance already referred to is here again noted, that those women who had the menstrual flow lessened in after life began at puberty with a longer average duration of the flow than was the case with those in whom it became increased after the occurrence of the laceration. Future observation must determine how far the complication of cellulitis with lacerations of the cervix may lessen the average duration of menstruation, for it would be natural to suppose that this injury would tend rather to increase the flow. Its indirect effect also on the circulation, in bringing about early atrophy by a certain degree of obstruction, has yet to be studied. Experience has fully demonstrated the importance of recognizing its existence in connection with the proper treatment of lacerations of the cervix, and the subject will be treated of at greater length under the proper head.

CHAPTER XXIV.

DIAGNOSIS AND TREATMENT OF LACERATIONS OF THE CERVIX UTERI.

iagnosis.—Lacerations through the neck of the uterus are of e frequent occurrence than has been supposed. In fact, I doubt woman can give birth to her first child without some laceration ng place ; but if it is slight it heals rapidly and causes no difficulty rwards. Even most extensive tears are seldom recognized at time of labor. The tissues are then so soft that, unless the rent passed beyond the cervix into the vagina and connective tissues, n scarcely be detected by a mere digital examination. Indeed, occurrence of the accident, in all probability, will not even be sus- ed, unless an unusual amount of hemorrhage should exist.

acerations in the median line are the most frequent, and those of anterior lip are more common than those of the posterior one. en in the median line and limited to the cervix, these lacerations erally heal rapidly, leaving scarcely a cicatricial line to mark their se. This is due to the fact that the necessary recumbent position of patient, which is enforced for some time after labor, keeps the raw aces in close contact by the pressure of the lateral walls of the ina until they have become firmly united.

o serious consequences, therefore, are likely to follow this acci- t through the anterior lip of the uterus, unless the rent passes ond the cervix through the septum into the bladder. Even when e extensive, the line may heal throughout, as there will have been oss of tissue from sloughing. This will frequently be the result roper attention has been paid to cleanliness, by the use of vaginal ctions of warm water, so as to prevent phosphatic deposits from urine on the raw surfaces.

ut, as a rule, when the tear has extended beyond the vaginal tion, a small vesico-vaginal fistula will be left in front of the cer- Or the laceration through the neck will heal from the os towards angle of the fissure where it will leave a sinus, along which the e will escape from the bladder into the uterine canal. Under the proper head this form of fistula will be treated of at length. Lacerations through the anterior lip generally occur in women who have borne a number of children, and in whom there exists great relaxation of the abdominal walls, and anterior obliquity of the uterus.

Lacerations through the posterior lip also unite readily, and the accident may not be suspected, unless the fissure should have extended sufficiently into the posterior cul-de-sac to set up an attack of inflammation. When cellulitis occurs at this point, and from this cause, it always induces a most intractable form of retroversion. Even when a laceration has been superficial on the vaginal surface, the cicatricial band, felt as a cord, will contract and so shorten the cul-de-sac as to render it impossible to adapt any form of pessary to it. To restore the uterus to its natural position, a surgical procedure has to be resorted to for the removal of this band, and often with most unsatisfactory results.

The history of the cases suffering from this form of laceration would indicate that the occurrence of the injury is due to the position of the occiput towards the sacrum. It is very rare, for any bad effects to remain after laceration either backward or forward, and when they do it is exceptional. When, however, the laceration is in a lateral direction, and extends beyond the crown of the cervix, a condition at once arises which will defeat all the reparative efforts of nature. In practice, therefore, we have to deal chiefly with the consequences of lateral laceration, and these effects are more marked when the lesion is double than when confined to either side. Whenever the rent has extended to the vaginal junction, or beyond, there will exist a tendency for the tissues to roll out from within the uterine canal as soon as the woman assumes the upright position. The posterior lip of the cervix catches on the posterior vaginal wall, as the uterus after a recent delivery is larger than natural, and is, from its increased weight, lower in the pelvis. When the flaps formed by the laceration are once separated, their divergency becomes increased by the anterior lip being crowded forward in the axis of the vagina. This will be towards the vaginal outlet, in the direction presenting the least resistance, while the same force naturally crowds the posterior lip backwards into the cul-de-sac. From thus forcing the flaps apart, a source of irritation is at once established, which arrests the involution of the organ. The angle of the laceration soon becomes the seat or starting point of an erosion, which gradually extends over the everted surfaces. With the increased size and additional weight of the uterus, induced by congestion, the tissues gradually roll out as

ıa the neighborhood of the internal os. As the laceration often
ırs in consequence of rapid labor, or from its having been neces-
to apply the forceps or to use traction, the perineum also is fre-
ıtly ruptured. Owing to a want of the proper support, and to
enlargement of the uterus, prolapse must occur, and the organ
s to the floor of the pelvis, where it frequently takes some degree
etroversion. The vagina cannot now regain its natural size, on
unt of the prolapse, and it becomes still more dilated, as the
us continues to advance like a wedge towards the vaginal outlet.
ometimes the laceration heals while the woman remains in bed
r her labor, but if the surfaces should not heal before she gets up
will soon become the seat of an extensive erosion, which bleeds
lily. As the uterus increases in size, a profuse cervical leucor-
a follows, and the appearance of a frequent show causes the
ent to seek relief. She will complain of inability to stand with
fort, and of a continual backache, with pains down her limbs,
etimes irritation of the bladder, and, as a rule, marked nervous
ırbance.

ntil recently, this condition of laceration was universally mistaken
ulceration, and sometimes for the early stages of epithelioma, and
corroding ulcer of the uterus. To heal this "ulceration" would
; baffle every mode of treatment, or, if any improvement took
e in the patient's condition after a protracted rest in the recum-
; position, a relapse would follow again and again, with every
mpt at exercise. Such a case passed from one physician to
her, until eventually the leucorrhœa ceased, and the profuse
struation diminished as the surfaces, from the repeated application
austics or the cautery, became cicatricial in character. Never-
ess, a woman in this condition gradually became a confirmed
lid, while the hypertrophy of the uterus remained, and from im-
ment of her general health the nervous element became most
inent.

here such a case has been left more to the reparative powers of
ıre, the mucous follicles will be found to have gradually under-
cystic degeneration. These little bodies can be felt like small
imbedded in countless numbers within the tissues of the cervix.
y become distended, rupture, and gradually empty themselves,
which the follicles are destroyed and their cavities disappear by
raction. At first the cervix was rather hypertrophied from the
ıg of these cysts, and as the inflammation and enlargement of the
cles extended within the canal, the extent of mucous membrane

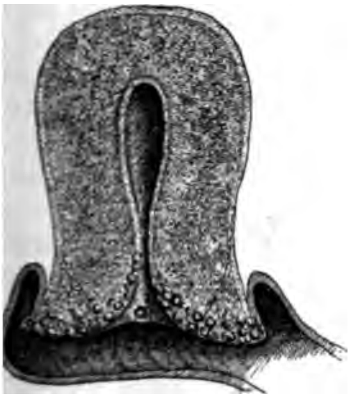
thus rolled out greatly increased. The cervix, however, and frequently the uterus itself, became gradually atrophied from the pressure exerted at first by the enlargement of the cysts, and afterwards by the contraction following their rupture. Occasionally the atrophy is confined to one flap, and when thus limited it is generally to the anterior one.

Eventually, when nature has been thus left to aid herself, the woman will frequently cease to menstruate at rather an early period in life, and will then gradually recover her health. Unfortunately, however, when the disease has existed so long as to induce a condition of profound anæmia, there remains no power in reserve to aid in bringing about a reaction, and phthisis becomes developed. Then, again, a woman in robust health may be able so far to repair the damage as to give birth to a number of children after the injury. She will manage to hold her position in good health for years, notwithstanding frequent menstrual hemorrhages and a wasting leucorrhœa between the pregnancies. But, finally, a change of life is completed, when epithelioma may spring into existence from the seat of the old injury, as a product of perverted nutrition.

Finally, in closing this description of the different forms of laceration, we must refer to one from within outwards, where the laceration does not extend through the thickness of the cervix. These are occasionally met with, and it is often exceedingly difficult to demonstrate that a laceration has taken place, although all the bad effects of the lesion are easily recognized. It would seem as if partial laceration took place from the internal os downward, on different sides, through the mucous membrane and deeper tissues, without extending to the vaginal surface of the cervix, making sulci not unlike those between the ribs of a partially opened umbrella, which disappear when it is fully opened out. Through the patulous os and canal the mucous membrane is seen prolapsed, and its appearance is like that presented after dilating with a sponge tent a partial contraction of the canal which had taken place above, but had not yet extended to the external os. The cervix is frequently but little enlarged in diameter, but its walls are seen to be thinner than natural. The cervical discharge is most profuse and tenacious. The menstrual flow remains too free, and is often irregular, and the uterus is found larger than normal.

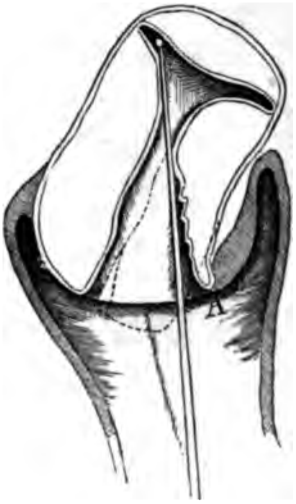
After labor, the whole organ being in a state of fatty degeneratio and the tissues of the neck soft, these flaps, in a double laceratio flatten against the posterior wall of the vagina or floor of the pelvi hat all appearance of laceration becomes lost. So perfect is the eption that it is frequently impossible for any one not familiar ı the condition to recognize the existence of a laceration by an lar examination alone. If a patient be placed on the back, and a tal examination made, the true condition can be easily appreciated. en there is simple hypertrophy of the uterus, the finger can easily ertain that the body of the uterus above is as large as the cervix ow. But with double laceration of the cervix, when the finger is sed up behind the uterus into the cul-de-sac, or in front, it will found that the cervix is much larger than the body. The rela- size of such a cervix to the body of the uterus is about that of top of a half-grown mushroom to its stem. If the patient be ed on the side, and the speculum introduced to bring the cervix view, these flaps can be rolled in. By seizing the anterior and erior lips of the cervix with a tenaculum in each hand, and then ging them together, the inverted portion will roll in toward the al. The shape of the neck will then be represented by the dotted in Fig. 79, and it will be found that its size is but little larger ı natural.

Fig. 79.



Double laceration of the cervix, showing enlarged mucous follicles.

Fig. 80.



Unilateral laceration, producing obliquity of the uterus.

Vhen the laceration has been complete, but confined to one side, rolling out is not so extensive, nor is the apparent size of the rix as large as in the previous condition, but it is as difficult often at first sight to detect the injury. A partial obliquity of the uterus in the pelvis is thus produced by the cervix being crowded towards the uninjured side, and this surface and the flattened lacerated portions may present a common plane to the posterior wall of the vagina on which it rests. As the flaps separate, the two edges and the uninjured side form a tripod, with two legs shorter than the third one, so that the fundus must necessarily be tilted toward the injured side (see Fig. 80). Cellulitis is a most common result of this accident, and is generally situated between the folds of the broad ligament on the side of the laceration. The effect of the cellulitis is to shorten the ligament, and the fundus will be fixed towards the injured side. This causes the parts which have been torn down to the vaginal junction, or beyond, to project into the passage, and as they are covered by a reflexion of the vaginal tissue over this part of the uterine body, just above the terminating point of the laceration (see Fig. 80), the effect to the eye is a length of cervix on that side equal to the uninjured portion. The apparent os is always more patulous than in health, and this condition is readily accounted for from the evident existence of disease within the uterine canal. Moreover, the deception is still maintained by the passage of the sound in the median line to the fundus, for its use gives no indication of the true condition. The explanation is that the sound passes through a patulous os, along the angle of the rent on one side of the cervix, to the horn of the uterine canal on the opposite side. As is shown in Fig. 80 these two points are brought, by the abnormal position of the uterus, into line with the axis of the vagina. So deceptive is the condition, that I have been frequently consulted as to the propriety of amputating an enlarged or elongated cervix, when if a small portion only of the apparent enlargement had been removed, the peritoneal cavity would have been opened. The cervix is never as large as it seems to be, and the line of junction with the vagina is equally deceptive. It is, therefore, a wise procedure, in any doubtful case, to place the patient for examination on her knees and elbows. On the introduction of the speculum the vagina becomes distended by atmospheric pressure, and by the aid of gravity the uterus is brought into its proper position. The true line of junction with the vagina will be then well marked, and only the actual length of the cervix will project above the vaginal surface. In a case of laceration on one side, extending to or beyond the vaginal junction, the fissure will be detected without difficulty, in this knee-elbow position. By the weight of the uterus its axis in the pelvis will be brought in line to correspond with that of the vagina, so that the depth of the cleft through the tissues can be appreciated at a glance.

TREATMENT.

The chief purport of treatment is to bring about union of the lacerated surfaces, and the question naturally presents itself as to the circumstances under which an operation is called for. I would state that in every instance where the condition is evident, and where enlargement of the uterus still remains, or where the woman suffers from neuralgia, I consider an operation necessary, notwithstanding the parts may have completely healed.

Every case of laceration is benefited by some preparatory treatment previous to the operation. The uterus, from its increased weight, and while resting on the floor of the pelvis, will, by traction on the cellular or connective tissue, obstruct the circulation sufficiently to produce not only increased congestion of the organ itself, but also of the neighboring tissues. To give tone to the vessels and relieve the congestion, large hot-water vaginal injections must be used once or twice a day, until all tenderness on pressure, which may have been detected by means of the finger, has disappeared. To hasten this the frequent application of iodine to the abdominal wall, or a small blister, is of great benefit when made over the seat of the cellulitis. If a broad ligament has become thickened and shortened from the previous inflammation, the whole weight of the uterus will be thrown upon it whenever the woman is in the upright position. As has been already stated, an old cellulitis is frequently kept up, as it were, from this single source of irritation not being appreciated. One of the first steps to be taken in the treatment of this condition is to fit some instrument which will lift the organ from the floor of the pelvis. Where a closed lever pessary can be used, it best answers the purpose, since it can remain undisturbed. The uterus must be first anteverted by means of the index finger in the vagina, and the pessary be then so curved as to hold the organ in this position. This is important, for by keeping the uterus anteverted the flaps cannot gape apart to any extent, and in preventing this we remove a source of irritation. To fit the pessary properly requires some judgment, for if, as has been shown, the uterus be lifted too high in the pelvis, we again put the shortened broad ligament on the stretch and produce a condition we wish to avoid. The best guide is the sense of relief felt by the patient, and her unconsciousness of the presence of the

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[illegible]
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for forty-eight hours, and have the vaginal injections omitted for the same length of time.

After a double laceration of the cervix, a partial constriction is often produced in the neck as the parts cicatrize, and especially is this the case when the tear has passed beyond into the vaginal tissue. This is often sufficient in extent to obstruct the circulation in the flaps when aided by cystic degeneration of the mucous follicles. Consequently the flaps become almost strangulated; the effect, in fact, is similar to paraphimosis. The next and most important step in the preparatory treatment is to relieve this congested condition by puncturing the cysts. A small, lance-shaped knife is needed for the purpose. It is not necessary to pick out each individual cyst. The whole lacerated surface may be gone over by little stabs in every direction, and the point of the instrument will penetrate the distended cysts more easily than it will enter the tissue of the cervix. Scarcely an ounce of blood will be lost under any circumstances, but from emptying the cysts, and from this bleeding, the size of the flaps will be greatly reduced. Churchill's iodine is then to be freely applied over the surface in which the cysts have been punctured. After this has been done, the flaps are to be brought together and kept in contact by a portion of cotton saturated in glycerine, which will crowd the neck into the posterior cul-de-sac. These scarifications are to be repeated again and again, and the iodine applied from time to time until the cysts have all disappeared, the flaps reduced in size, and the erosion greatly lessened in extent or healed. I have frequently resorted to the use of a silver wire, passed through each flap at about half an inch from the edge; by twisting the two ends until the lacerated surfaces are brought just into contact, the parts may be temporarily prevented from rolling out. This, however, is to be done only while the patient remains quiet, for if she were exercising, the wire would soon cut out, or act as an irritant.

Punct. cysts

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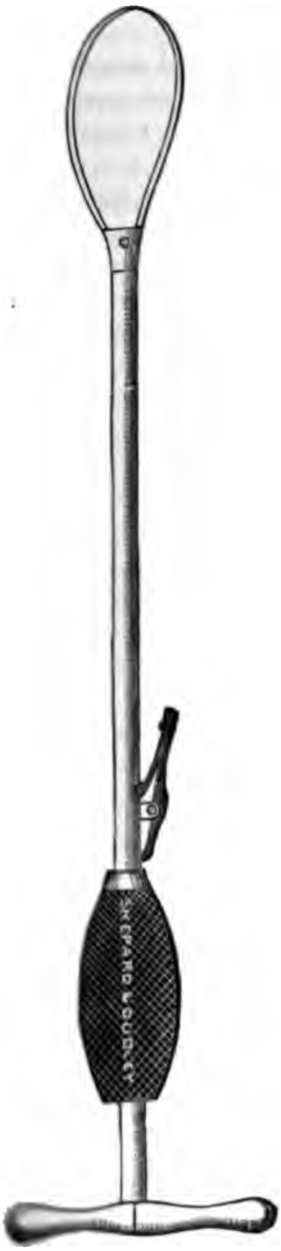
If the operation be performed after the different sources of irritation have been removed, the uterus will be reduced rapidly in size, and the patient will not only regain her health, but will remain in the full enjoyment of it afterwards. So long, however, as there can be detected, by pressure with the finger, any tenderness in the neighboring connective tissue, it is not safe to operate. We may feel fully satisfied that a certain amount of cellulitis has previously existed, and a condition is still remaining which would require but a slight provocation to re-establish the inflammation.

Fig. 81.



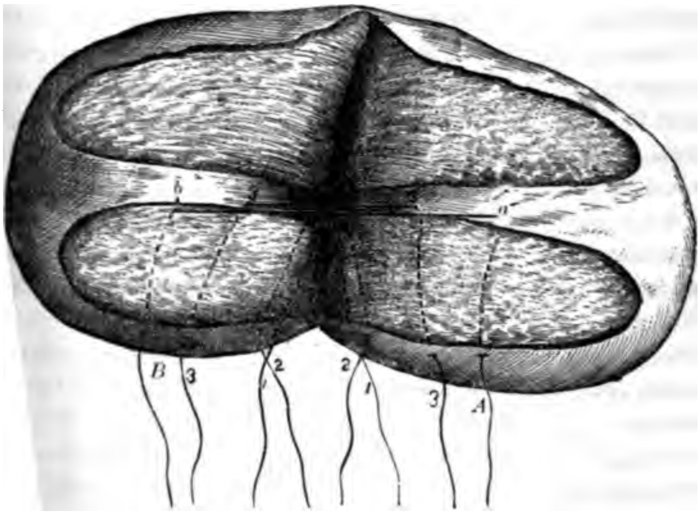
Uterine tourniquet.

The usual mode of operating is to place the patient on the left side, and to use Sims's speculum, or some other perineal retractor, to bring the parts into view. The operation can sometimes be performed on the back, when the vaginal outlet is large, since the uterus is then so low that it can be readily drawn outside and returned after the operation. But the left side has this advantage, that, while the patient is in this position, there will be less rolling out of the tissues than in any other, except in the knee-elbow position.

The first step is to bring the flaps together in apposition, and, while they are lifted up by means of the double tenaculum in the hands of an assistant, the uterine tourniquet, Fig. 81, is to be slipped over the cervix below the point of vaginal junction and tightened. The object of this instrument is to control the hemorrhage during the operation, as it is sometimes excessive. Until I had this instrument made, I used a portion of twisted wire, such as is usually furnished for the écraseur, the two ends of which were passed through a canula. The loop was slipped over the neck of the uterus, while being held by an assistant, and tightened by sliding the canula down the wires held in the other hand. As soon as the cervix was compressed as much as possible by this means, the ends of the wire were bent back, and several times wrapped around the end of the canula, so that they could not slip. The instrument above mentioned has, instead of the wire, a portion of watch spring passed through a canula, and in the handle is the double ratchet of the écraseur to tighten the loop about the cervix. Just before constricting the neck with either instrument, I e the precaution to draw up with a tenaculum, through the loo icient vaginal tissue all around the cervix to enable the flaps to b ught together easily. The fold thus formed renders the instrumen likely to slip over the cervix when it has become reduced in siz n the escape of blood during the operation.

Jntil recently I regarded this uterine tourniquet as essential in ry operation for closing a lacerated cervix. I now confine its use irely to operations when the tissues of the cervix are unusually , since I have learned from experience that the loss of blood is ly, in such cases, to be very great. But under ordinary circum- ces I have found that the administration of a large hot-water inal injection, just before the operation, will so far lessen the ding that the tourniquet can be dispensed with.

Fig. 82.



Lacerated cervix after denudation.

2 is an accurate representation of the size and appearance of in a case of double laceration, with complete procidentia, I operated several years ago at the Woman's Hospital. The from one made at the time by Dr. W. Gill Wylie, then eon. Just previous to the operation the depth of the uterus ches and a half; ten days afterwards the length of the een lessened one inch and a half, and at the end of six terus had returned to its natural size. The operation was

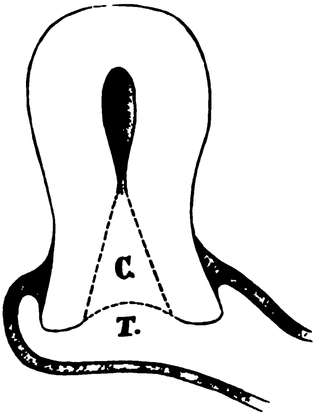
[illegible] with the cervix outside of the labia, and it was then returned to its proper position in the pelvis.

This illustration has been selected to show the necessary extent of tissue to be denuded, and the direction by which the sutures are to be introduced. At the beginning of the operation it is always necessary to open out the flaps so as to expose fully the lacerated surfaces which are to be denuded. As shown by the illustration, the surface is to be removed from one lip to the other, leaving a broad undenuded tract in the centre, from before backward, which is to form the continuation of the uterine canal to the os. The freshened surfaces, as shown in Fig. 82, do not apparently extend out to the full width of the flaps, but this is deceptive from the hypertrophy of the parts being greater beyond. The undenuded portion on each flap is made to correspond with that on the opposite side, and should widen gradually from the outer end of the uterine canal towards the limit of the laceration. Therefore when the flaps are brought together, the new canal through the cervix will be trumpet-shaped. As the uterus gradually returns to the normal size (and the change will be the most marked in the cervix) this new canal will become of a natural and uniform diameter throughout. To make this canal of a proper size, we must be guided by the amount of hypertrophy in the flaps. It must bear some relation to the increased size of the flaps, and the trumpet shape is necessary, since the hypertrophy increases in degree from the bottom of the laceration towards the outer edges of the flap.

Either the scissors or the scalpel may be used to freshen the surfaces, but I prefer the scissors, for the greater rapidity with which the tissues can be removed with them. It is necessary when freshening the surfaces to remove very superficially the tissues near the outer angles of the fissure, just at the vaginal junction, unless the laceration should have been a very extensive one. The circular artery, owing to its elasticity and its position in loose connective tissue, is seldom ruptured when a laceration of ordinary extent takes place. But as the parts contract after cicatrization, it is frequently left just at the termination of the angle of the fissure with the vaginal tissues. When the tissues are dense, I sometimes have to use a scalpel to denude the angle at the bottom of the laceration, when confined to one side. We frequently meet with cases where nature has attempted to repair the injury, and to prevent the gaping of the flaps, in a double laceration, by filling in the angle on each side by granulations as the parts have healed. The result is that a dense cicatricial plug (C, Fig. 83) remains. When this condition exists, there is often much reflex disturbance of the nervous system, and frequently it is the exciting cause of neuralgia in other parts of the body.

It is important to draw particular attention to this cicatricial tissue, that its existence may not only be recognized, but the necessity for its removal fully appreciated. Apparently the limit of the laceration is along the dotted line T, and the extent of injury seems very superficial, when, in fact, it may have been very deep. When this surface only has been denuded and the sutures introduced, the operator will be surprised at the difficulty experienced in bringing the parts properly together. Let the reader place an ordinary sized wooden spool in the angle between two of his fingers and then attempt to bring together the sides of these fingers. It can be done by force, but it is at once realized that the circulation becomes obstructed; and so the lips of a laceration would meet with similar resistance if this cicatricial plug is shut up between them, and any sutures introduced through them would be likely to cut out. When the parts have been thus closed, shutting up this mass of cicatricial tissue, there will be no improvement even should they unite perfectly. The uterus will remain quite as large as before, and frequently will even increase in size. The appearance of the neck will show that the circulation is obstructed, and as nature must attempt to relieve this by an increase of secretion from the uterine canal, an erosion soon forms. A fresh attack of cellulitis is not an unusual occurrence, since the position of the uterus will have been disturbed to an unusual degree, in consequence of the great difficulty experienced in the introduction of the sutures through this dense tissue. Finally, there will be a marked increase of the anæmia and the neuralgia, owing to the additional irritation to the nervous system, and nutrition becomes still further impaired. The only remedy is to remove the whole mass on both sides in a V-shape, and to secure the surfaces thus made with sutures, as in the operation for double laceration. But one precaution is necessary, and that is to disturb the position of the uterus as little as possible, since so extensive a laceration must have produced cellu-

Fig. 83.



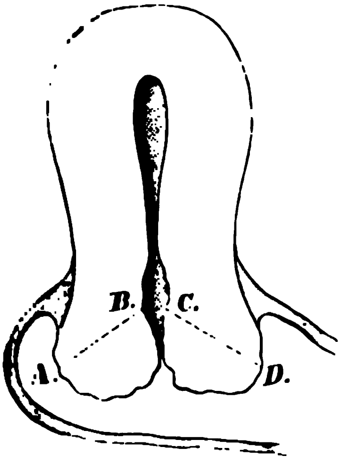
Cicatricial plug in a lacerated cervix.

less at the time of the occurrence. If the uterus be then dragged down at the operation, the force of the traction must be spent on the shortened broad ligament, and a fresh attack of cellulitis will be the consequence.

Under other circumstances, when the case has been of long standing, many cysts will have formed and ruptured, from which cause contraction takes place along the edges of the mucous membrane of the canal and vaginal surface. The effect of this contraction is to convert the former flat sides of the flaps into two convex surfaces in apposition with each other. Were we simply to freshen these surfaces in a superficial manner, and then attempt to bring them together, we would fail to approximate the outer edges properly, unless the sutures were twisted so tight that they would cut out. This tissue is cicatricial, and constitutes so dense a foreign body that, were we to succeed in obtaining union, it could be only temporary, for the previous condition would soon be reproduced through want of vitality.

Not only is it necessary to remove entirely this projecting surface, but even partially to excavate, that the sides of the flaps may be brought into close contact throughout, when the sutures have been secured. The lines A B and C D, Fig. 84, indicate the portion to be removed, but this removal is not to extend entirely across the flap, for if this were done, there would be a complete closure of the cervical canal. Nor is the removal necessary to this extent, since the

Fig. 84.



Cicatricial hypertrophy after laceration.

Fig. 85.

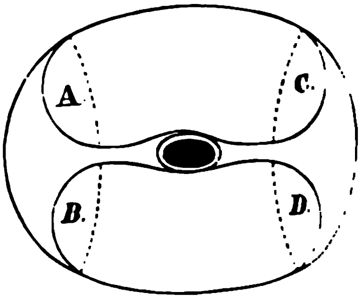


Diagram of surfaces to be denuded.

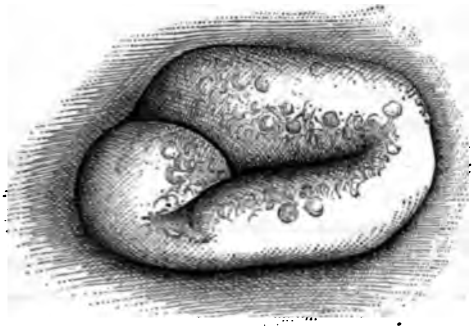
hypertrophied portion is chiefly that part which is shown in Fig. 84, and represents the amount to be denuded.

This will be made more evident by reference to Fig. 85, which shows a horizontal plane, as it were, of the cervix. Here the hypertrophied tissue is indicated by A B, C D, and is to be removed to the bottom of the laceration, along the dotted lines, so that the surfaces A and B, C and D, can be brought together by sutures. The same precaution in regard to pulling the uterus down, as was urged in the previous condition, must be observed here also, through fear of exciting cellulitis.

The cervix is sometimes lacerated in a bifid form, or in three and even four sections. Were we to denude between each cleft, and then attempt to bring all these flaps together, the result would be, in all probability, a failure, since the traction in opposite directions would cause the sutures to cut out.

One or more of these flaps is usually hypertrophied and much out of proportion to the rest, so that it would be difficult to approximate the surfaces properly. But a glance at Fig. 86 will show that on removing a small segment, by a V-shaped incision, it would be easy afterwards to bring together the freshened surfaces, so that both the cervix and canal would be restored to a normal size.

Fig. 86.



Bifid laceration of the cervix.

When lacerated into four sections I have removed on each side a segment, and then brought the remaining flaps together as in a double laceration.

With a knowledge of this principle, it will require but little study of any individual case to realize almost at a glance the proper course to pursue

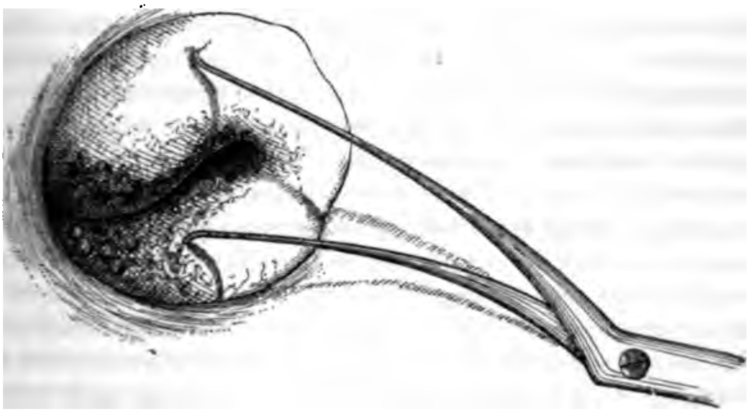
When it is safe to do so, the process of freshening the surfaces is very much facilitated by drawing the uterus gently down towards the vaginal outlet, and then having the organ steadied by a strong tenaculum in the hands of an assistant. The nearest portion, or that which is the lowest, should be removed first, since by doing so the view is less obstructed by blood running over the surface. The portion to be removed is to be hooked up with a small tenaculum, and the strip kept on the stretch, while it is being separated, and if possible it should be removed in a single piece from the side of one flap to the other. This is the best plan to insure the denudation of the whole surface when the oozing of blood is at all free. With the use of either the knife or scissors, the freshened surfaces should be made as smooth as possible, and uniform in extent. The best results are obtained when we get union by the first intention, but to gain this it is necessary that the parts should be approximated with some degree of accuracy, for a projecting edge, left to heal by granulation, cicatrizes and afterwards contracts. The presence of a cicatricial cord across the cervix may give rise to as much disturbance as the original difficulty.

When the injury has been of long standing, and the tissues have become dense, the chief difficulty in the operation is experienced in passing the needles. The short round needle, which I was the first to use for operations about the vagina, has the advantage of making only a punctured wound, and when the suture which it carries is introduced, it so fully occupies the tract, as was stated when treating of operations on the perineum, that there is little danger of oozing of blood, as after the use of the needle with a cutting edge. But the more dense and indurated the tissue, the less vesicular will be the parts. Under these circumstances, the lance-pointed needle, being easier of introduction, answers best for the purpose; but if the tissues are soft, the round needle should be used. Three or four sutures are required for each side, if the laceration be extensive or double. They should be introduced, as illustrated in Fig. 82, from A, at the outer portion of the flap, to *a*, at the edge of the surface which is to form the canal, and then, from within outwards, through the other flap from *b* to B, so as to correspond. The chief object, however, is to make an accurate approximation along the vaginal surface, since the edges forming the canal will be kept in contact much as the inner edges of the staves of a barrel are by a properly fitted hoop. When the bleeding has been troublesome, it is advisable to pass the first suture through the vaginal tissue, a short distance below the angle of the laceration. The circular artery, or its branch, from which the oozing generally comes, will be secured by this plan. When the laceration is a double one, the sutures for the opposite side must all be introduced before securing those already passed, or great difficulty will be experienced; and should there be an unusual amount of bleeding, it can be arrested by twisting the interrupted suture nearest to the bottom of the angle. Before doing so, however, it would be better, where the tourniquet has been used, to see if the hemorrhage cannot be controlled by tightening this instrument, as it may have become loosened in consequence of the shrinkage of the neck after the escape of the blood which was confined within the tissues when the instrument was first applied.

The mode of securing the sutures by twisting has been fully described under the head of "silver sutures and mode of introduction." If the sutures are properly bent over, so as to lie close to the surface of the neck, and are cut off at half an inch in length, they may remain undisturbed for an indefinite time without causing irritation. I have met with several cases where the bleeding was profuse on removing the tourniquet after completion of the operation, but in each instance it was arrested promptly by an injection of hot water administered before the effects of the anæsthetic had passed off.

To close a laceration on one side only, is rather more difficult than if it were a double one. This is in consequence of the difficulty of properly denuding the angle, and of freeing it from cicatricial tissue. The double tenaculum in the hand of an assistant will be found useful to keep the flaps apart, and to steady the uterus while the angle is being denuded with either scissors or scalpel (see Fig. 87). It is

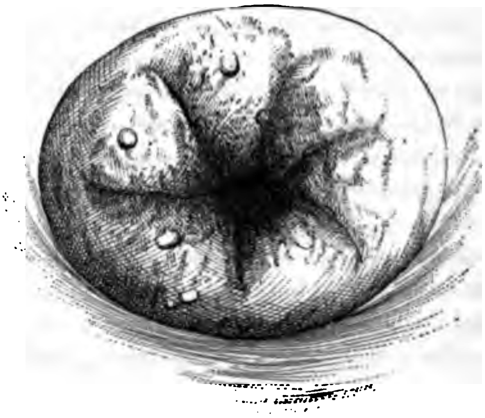
Fig. 87.



Double tenaculum, separating the flaps of a laceration.

well to institute some preparatory treatment in cases of multiple or stellate laceration, Fig. 88, but, as a rule, little benefit will result except from the use of strong solution of chromic acid or some other agent which will cause the canal to contract. If this, however, were all there is to be accomplished, the use of the cautery would be the most prompt and efficient means, not only to cause the canal to contract, but to heal rapidly the erosion, thus checking the profuse cervical leucorrhœa and free menstrual flow. But after having accomplished this by such means, it is evident that the mucous membrane will be entirely changed in character, if it is not destroyed.

Fig. 88.



Multiple, or stellate, laceration of the cervix.

An operation will be necessary, should the injury be so extensive as not to yield, after a reasonable time, to the application of iodine, the spirits of turpentine, the acetic solution of cantharides, or any other remedy which might be employed for the purpose of bringing about a new action in the prolapsed and lacerated tissue, without, at the same time, destroying its integrity. The operation in itself is simple, the cervix being divided with a pair of scissors, on each side, to the vaginal junction, thus bringing about, as it were, a double laceration. It will then be necessary to increase the area of the denuded surfaces by removing a sufficient amount of tissue on each side, so that the canal will be restored to a normal size when the flaps have been brought together with sutures.

The subsequent treatment will be the same for any form of laceration, and will consist in confining the patient to bed for two weeks after the operation, for fear that the flaps may separate, while perfect rest in the horizontal position will facilitate the decrease in the size of the uterus.

There will generally be no necessity for keeping the bowels constipated, nor for restricting the diet, provided its quantity and quality be suitable for one remaining in bed. The bladder should be emptied by means of a catheter, or a bed-pan should be used. But when the urine has been passed on the bed-pan, a little warm water should always be injected into the vagina immediately afterwards to prevent any urine which may have entered the canal from remaining in contact with the uniting surfaces. In addition, on the second or third day after the operation, a vaginal injection of tepid water should be given once a day, or night and morning, if there should be much discharge.

The sutures are generally removed on the seventh day, and some care is needed in withdrawing them, as the line of union is frequently weakened by carelessness in doing so. When the patient is placed on the left side, and the cervix has been brought into view by the use of Sims's speculum, the lower portion of the loop should be cut close to the end of the twist, and then withdrawn. Each portion of the loop will then bind together the parts until it has been removed, while if we should cut the upper part and make traction, the surfaces would be drawn asunder. It is best to remove first the suture nearest to the vaginal junction, for if there should be any tendency to gape in the line, the others can be left for several days longer, so that the ununited portion may heal by granulation.

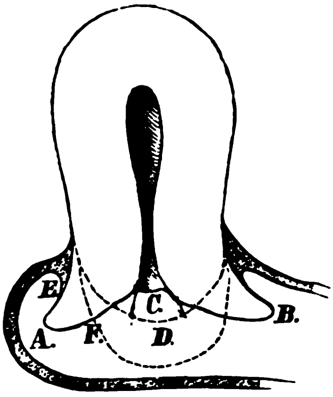
It is of great importance that the patient should not sit up in bed for ten or twelve days after the operation. A portion of the line is very apt to separate after the sutures have been removed, if this be neglected. Moreover, to get up would expose her to the effects of cold, and cellulitis, if it has existed, is likely to recur on a slight provocation.

When retroversion has existed, and a pessary has been used, it is best, as a rule, to remove it at the time of the operation, and to replace the instrument only when the patient begins to stand on her feet. If the uterus is left anteverted, as it should be after the operation, and then replaced by the finger if necessary when the sutures are removed, it will generally remain in this position while the patient is in bed. But should the uterus be allowed to become retroverted again, it will be crowded lower into the vagina as soon as the patient begins to exercise. Traction will be at once made by the walls of the vagina on the anterior and posterior flaps. The result will be that the original condition will be reproduced. Or, on account of obstruction to the circulation, the hypertrophy of the uterus will increase, and an erosion will soon form on the cervix which will ultimately extend to the uterine canal. This most important feature in the treatment, viz., the necessity for placing the uterus in a proper position, is frequently overlooked: it is not only necessary preparatory to the operation, but it is a very essential means for obtaining beneficial results afterwards. After the sutures have been removed, the uterus will decrease rapidly in size if there exists no cause of irritation to arrest its progress. Therefore to favor this change an early resort to some mechanical support is advisable, to lift the uterus from the floor of the pelvis, and to keep it anteverted if possible. The instrument used previous to the operation will now be found too large, but in any event a smaller one should be employed if possible, that the vagina may return to its natural size from the over-stretched condition induced by the prolapse.

As soon as the patient has sufficiently regained her health, and other circumstances will admit of it, the lacerated perineum, if a laceration has existed, should be closed, and, if necessary, the operations on the vaginal walls should be performed for restoring the canal to its normal size. These operations should be done afterwards, for it is not good practice to attempt to operate on the lacerated cervix and at the same sitting close the perineum. After the patient recovers from the latter operation, the question will arise as to the necessity for some modification in the size and shape of the pessary which had been previously worn, or as to the propriety of discontinuing its use. As a rule, there will be no need for any local treatment afterwards if she has undergone the proper preparation for the operation. Then with the improvement in the general condition all discharge will cease, and the uterus will gradually regain its normal size.

A condition is sometimes found after the operation for which I cannot yet offer a satisfactory explanation. Fig. 89 represents a double laceration, and at *C* is shown what, in consequence of the distance to which the laceration seems to have extended (from *A* and *B*), is supposed to be the internal os. We will suppose an ordinary case as to relative measurements, and that the depth of the uterine canal from *C* is three and a half inches, while the length of each flap is (from *C* to *A* and *B*) an inch and a half more. Now, were we to denude these flaps and bring the surfaces together with sutures, the natural inference would be that they must occupy the space included by the dotted line *D*, and the depth of the canal would then be five inches. Such, however, is not the case, for although we may unite these flaps, and apparently add an inch and a half to the depth of the canal, there will be but little increase above what it was before the operation. In other words, when the flaps *A* and *B* have been united, they will come together at *C* instead of at *D*, with but little increase, and sometimes with even a slight decrease in the length of the canal after the operation.

Fig. 89.



Effect of laceration involving the vaginal wall.

The only explanation I can offer is based on the supposition that the laceration is limited to the cervix and does not reach the body; that it involves chiefly the vaginal wall, and is never so extensive as seems apparent to the eye. When we see a laceration through the cervix apparently extending upward into the uterus for an inch and a half, it is probable that two-thirds of the length of the tear is in reality on the vaginal wall. As the enlarged uterus prolapses in the canal after the injury, it of course carries with it a reflection of the vaginal walls like a stocking which becomes doubled on itself. Therefore, when *A* is supposed to be drawn to *C*, this doubling up of the tissues is pulled out, and *A* will then occupy about the position of *E* on the vaginal wall. If this be true the cervical flap does not extend to *A*, and, in all probability, not beyond the dotted line at *F*. We may then suppose that the difference is due to the fact that the vaginal tissue covering the circumference of the cervix has become thickened in consequence of the laceration. When the sides of the laceration through the cervix are brought together, the effect is to draw out, as it were, the neck from this surrounding, and the vaginal tissue looks as if it had retracted sufficiently to leave the cervix exposed. If this is the explanation, there can be comparatively little gaping of the cervix itself; yet there is quite enough to cause much disturbance, but not so much as would be were the injury to the uterus greater. The rent through the neck of the uterus is in reality a small portion of what seems to be the depth of the fissure, and to this we may attribute the little change found in the length of the canal after the operation. It is evident that when these flaps are united the excess of tissue is stripped back from the cervix, and the line of union is then chiefly in the vaginal wall.

It is not unreasonable to suppose, in consequence of the continued irritation dependent on the laceration, that a condition of congestion is kept up in this erectile tissue, and may be termed an erection of the uterus. In consequence of the loss of blood at the time of the operation, and of the subsequent removal of the source of irritation, this state of erection will gradually cease, so that the uterine canal may shorten from an inch to an inch and a half in the course of ten days, as I have frequently observed.

As soon as the practitioner becomes able to recognize this lesion under its different forms, he will be surprised to find a new explanation of all his cases of elongated or hypertrophied cervix, as well as those of ulceration. Let him in all such cases simply make the attempt, with a tenaculum in each hand, to bring the points *A* and *B* (Fig. 89) together at *C*, and a revelation will be opened to him. It will be necessary to employ Sims's speculum, or some instrument of the same kind, for otherwise the condition will not be detected. This I believe to be difficult with any valvular or cylindrical instrument, for these put the parts on the stretch. To this fact is doubtless due the difference of opinion which exists to-day as to the frequency of this injury. But let any one once master the diagnosis, and he will not fail to recognize the protean nature of lacerations, and will never see another case of hypertrophied cervix, or a so-called elongated neck. Moreover, he will never have occasion afterwards to amputate the cervix, at any portion of it, except for malignant disease. This has been my experience during the past nine or ten years, and in so large a practice that, if hypertrophy and elongation existed in reality, I could not have failed to recognize them. What observer has ever met with either of these conditions, except after childbirth or an abortion? Why may they not then be due to laceration? I will, no doubt, be reminded of certain cases of supposed elongation of the cervix found in unmarried women, but I deny that such a lesion exists, as will be shown hereafter.

From my standpoint, therefore, I can but denounce an amputation, with scissors, knife, or cautery, of a so-called hypertrophy or an elongation of the cervix as malpractice. I also deprecate, as even more uncalled for, the application of the cautery or caustics to heal a so-called ulceration on surfaces which can be readily united and brought into a healthy condition. Nothing is proved by the statement that a certain number of women have recovered their health after the cervix or a portion of it has been removed, for I have seen many after my own work in this line do so. A man may doubtless enjoy good health after the head of the penis has been removed, even if it were done with the cautery, yet, if the operation is unnecessary, it would be malpractice to perform it. The rule, however, is not for permanent benefit to result, for no woman can remain in continued good health so long as an extent of cicatricial tissue exists in the vagina, for both her nervous system and her nutrition will suffer from it. Amputation of the cervix, or the repeated application to it of cautery or caustics, will maim any woman, and most likely render her sterile; and for the want of the support which the cervix normally affords, she will be liable to suffer from displacement of the uterus. If this so-called hypertrophy, or this elongated cervix, should prove to be simply a laceration, the sides of which can be brought together and united, so that the integrity of the parts will be as perfect as if the accident had never occurred, then to resort to ablation or cauterization is malpractice.

To those who are familiar with this subject it will not seem as if it had been treated of to an extent beyond its merits. Its importance cannot be exaggerated, since at least one-half of the ailments among those who have borne children are to be attributed to lacerations of

CHAPTER XXV.

AMPUTATION OF THE CERVIX UTERI.

Never called for except for malignant disease—True elongation of the cervix does not exist—Double laceration often mistaken for elongation—What is the true condition?—Treatment by the cautery—Intra-uterine stem pessary—Mode of amputating—Cicatricial cervix.

I ENTER upon a consideration of this operation immediately after treating of laceration of the cervix, not because there is any connection between the two, but because I desire by the juxtaposition to make more emphatic my condemnation of amputation as a remedy for laceration in any of its forms.

I advance the statement, without qualification, that this operation, as at present applied, is to a greater extent a malpractice, and is attended by more evil consequences than any other procedure now resorted to in this branch of surgery. In fact, I am satisfied from experience that removal of the cervix is never called for except in some forms of malignant disease. The operation is, I grant, still held by the profession to be a legitimate one, but its supposed necessity is based upon false pathology. The commonest error of the day is a mistake in diagnosis between a laceration of the cervix and its supposed enlargement or elongation. I have not amputated a cervix in some nine years for any other condition than that of malignant disease; nor seen in the same space of time a single instance of hypertrophied or so-called elongated cervix, which was not due to laceration of the uterine os and neck. Since amputation of the cervix was for years an operation frequently performed by me for the relief of those supposed conditions which I now no longer find, but which I recognise and cure as lacerations, the inference is a natural one that formerly I was in error. I confess that this was true, and it is equally true to-day that the profession all over the world are cutting off and burning off parts of the cervix which, if otherwise properly treated, would result in restoring the uterus to its normal condition. I am not an enthusiast, I have not deceived myself, nor do I exaggerate these statements in the slightest degree, yet I have no doubt the truthfulness of my position will be questioned. But let the reader carefully study the description, already given, of lacerations of the cervix, and, in any case of doubtful diagnosis met with in practice, let him make the attempt to bring opposite surfaces of the uterine lips together, and he will be surprised at the result. Whenever he fails to demonstrate that the parts have been lacerated, it will be the exception to the rule, unless, indeed, the fault rests with himself in his want of the necessary knowledge.

It is true that occasionally, after a laceration, the parts become hardened, thickened, or elongated, and cannot always be adjusted with any degree of accuracy. Nevertheless the true condition may be recognized, and the parts properly treated until they can be brought together in a more healthy state. I grant that cases of hypertrophy of portions of the cervix are frequently met with, and cases of apparent enlargement resulting from a REDUPLICATION of the vaginal wall covering a prolapse, but amputation is not the remedy for these. I am almost prepared to deny that such a condition as elongation of the whole cervix ever exists; it certainly is never found in a woman who has ever been impregnated. Sometimes when lateral laceration has occurred, the anterior lip becomes apparently elongated, and even this, as a rule, is a deception: the posterior flap becomes caught on the posterior vaginal wall, while the anterior one is crowded forward in the axis of the vagina. This will cause the parts to roll out more extensively, and the excess of tissue becomes crowded on to the anterior flap. When such a case is examined on the knees and elbows, the apparent enlargement disappears, and it becomes evident that the true condition is one of laceration. Since I deny that under any circumstances amputation would be justifiable, or ought ever to be employed for the relief of this condition, it will be unnecessary for me to enter into a consideration of the evil consequences attending the practice.

Among the sterile and unmarried women cases occasionally come under observation which are supposed to be instances of elongated cervix, when the disease IS NOT IN THE CERVIX PROPER, and instead of there being an enlargement of this portion, actual atrophy is the rule. Some change in the character of the tissues forming the supravaginal portion of the uterus takes place, of the precise character of which I must confess my ignorance. It is to be hoped that at some early date the pathologist may be able to throw sufficient light on the subject to indicate the proper mode of treatment. In such a case THE UTERINE BODY BECOMES ELONGATED when the woman stands, and while the FUNDUS REMAINS STATIONARY the tissues below stretch out, as if formed of soft putty, becoming elongated by their own weight. In this prolapse the uterine neck is pushed forward in the vagina, and frequently beyond the outlet, and THE SUPRA-VAGINAL PORTION OF THE UTERUS APPEARS WITH A COVERING OF THE VAGINA, PRESENTING THE APPEARANCE OF AN ELONGATED CERVIX. The probe may be passed in such a case five or six inches, or a large blunt sound can be introduced to the fundus, when, if the cervix be drawn down with a tenaculum, along the staff to the handle, the depth of the canal is shown to be eight or nine inches. If the finger be introduced in the rectum, the body of the uterus will be felt much attenuated, and when the cervix is drawn down to the full length of the sound, the instrument seems to have little more than a membrane covering it. If we next place such a patient on the knees and elbows for examination, the change brought about will be a remarkable one. THE WHOLE OF THIS ELONGATION WILL DISAPPEAR, if there has not been cellulitis, and the uterus will be found but two and a half inches in depth. The cervix itself, as a rule, is atrophied, as the result of the continued traction made by the vaginal tissues during the prolapse. In this position the uterus seems to shut up, falling together by its own weight as would an old worn-out spy-glass if held upright.

The fundus of the uterus seldom becomes involved in this prolapse, nor is traction exerted on the peritoneum at any point. The disease is evidently confined to a space of scarcely more than an inch from the vaginal junction. As the prolapse occurs the surrounding cellular, or connective, tissue is carried with it and is equally stretched. This is the explanation of the fact that the bladder and peritoneal cavity are rarely entered when a supposed elongated cervix has been amputated. The line of separation through the uterine tissues is usually made between the upper and lower portion of the vaginal junction; and the cellular tissue above, in connection with the peritoneum, is a protection, while the peritoneum itself often escapes injury in consequence of its distance.

I am inclined to believe that an error of diagnosis has been made whenever the peritoneal cavity or bladder becomes involved in the operation of amputation of the cervix. In every instance, when the accident has occurred within my knowledge, the woman had borne children, and I, therefore, drew the inference that there had been no elongation, but a double laceration of the cervix.

Of these cases of prolapse, due to this elastic condition above the vaginal junction, I have met with two instances where permanent benefit seemed to have followed the removal of a portion of the neck. On the other hand, I have had five cases which were not benefited, but, on the contrary, made much worse. I feel, therefore, that we may question whether the advantage gained is ever more than a temporary one. It may be stated that of these cases five only remained for any length of time under observation. The others were apparently relieved, temporarily at least, but they may have passed into the hands of others. It may be claimed that my failure was due to the comparatively insignificant amount of tissue removed by me. This, however, is not the case. Moreover, my views were formed from a knowledge of the results obtained by others before my first operation. In addition to these five cases of my own, I have had under my care at the Woman's Hospital fifteen or twenty cases in which the cervix had been amputated by others. In all of these the full length of what was supposed to be the cervix had been removed. In some of these cases the prolapse had been cured by the removal of a large portion of the diseased tissue, and by the subsequent contraction. But in all, the uterus had become again enlarged, in all probability more so than before, and from the loss of the uterine neck it was impossible to keep the uterus from falling about the pelvis in every direction.

Yet under certain circumstances, as shall be shown, a partial amputation of the cervix may be performed. But I hold that the removal of any portion of the uterine neck is uncalled for, except as stated above, and for the removal of malignant disease. This has led me to consider the operation more in its relation to this lesion of the body of the uterus, than as a special procedure in uterine surgery. Having, however, gone thus far, it would lead to confusion and some repetition hereafter to omit all reference to the modes of treatment to be resorted to in those conditions for which hitherto amputation of the cervix has been employed.

The portion removed in the usual operation, although unnecessarily large, is of itself too small to afford mechanical relief to the prolapse. The chief benefit, if any, derived from the operation is, I believe, due to the revulsive effect, and possibly to a limited cellulitis, which may be set up around the diseased portion. I would therefore recommend that amputation be employed as a last resort after other means have been fairly tested.

I have observed good results follow the frequent use of sponge tents to dilate the whole canal. After their removal I am accustomed to inject a quantity of hot water into the uterine canal, and then to apply iodine freely.

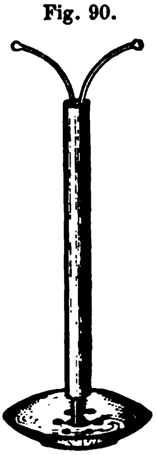
Some means should also be employed to prevent the recurrence of the prolapse, and for keeping the parts continually in close contact for a length of time. After treating the case in the above manner the patient may be placed on the knees and elbows for the purpose of introducing a little cotton, saturated with glycerine, as a temporary means of preventing the prolapse. An inflated India-rubber disk, as described for use in lacerations of the cervix, may be temporarily employed, but not if it can be avoided, since by long use, it must necessarily dilate the vagina, and so as to add to the difficulty. A permanent pessary is best made of hard rubber, well fitted to the size of the vagina, but with less curve for the posterior cul-de-sac than would be otherwise applicable. A light cup of rubber must be used to contain the cervix, and this is to be swung at the proper point between the sides of the pessary, by a pivot on each side. The perfect fitting of this instrument will prevent any prolapse of the neck, and at the same time keep the uterus anteverted whenever the patient is on her feet.

I have seen benefit, I am sure, from the application of a blister on the cervix after each period. Until this has healed, which requires some five or six days, the patient must remain in bed. She should employ the bed-pan, and not assume the upright position until the cessation of the discharge, and the pessary has been again adjusted.

The plan of employing the cautery has suggested itself, but I have never put the treatment into practice, and am quite sure my opposition is founded on correct principles, since the chief effect of the cautery is to bring about a condensation of tissue, a result which we know is very objectionable under almost all circumstances.

After the uterus has been fully dilated and shortened from placing the patient on the knees and elbows, it has occurred to me that much advantage would be derived from making four lineal applications, of a properly shaped cautery, along the sides of the canal to within a short distance of the os, from which, if the os be properly protected, no serious consequence will be likely to result. This treatment would establish a powerful revulsive effect, and act mechanically, just as it does when applied to a prolapse of the rectal tissue. The presence of these cicatrices would produce no irritation through the medium of the sympathetic, since they would not be made in pure erectile tissue, nor would contraction of the canal be likely to occur unless the os uteri had been also involved. The selection of this method would be only a of evils, yet it could never produce the bad consequences which ntly follow amputation with the galvanic wire or the écraseur. atever information may be gained by future investigation, as to thological cause of this singular lesion, experience certainly s the necessity for correcting the prolapse, and for carefully ing against its recurrence for an indefinite period. For this se I believe that a self-retaining intra-uterine stem may prove . It may be formed of two portions of steel, which have been red with a curve in opposite directions. The two lower ends be joined together below and secured by screwing into a light The upper ends should be protected by a ter- bulb for each. Over the two springs should a cylindrical stem, which would bring the two d extremities together for their introduction, but drawn towards the cup would allow them to ate, each one to occupy a horn of the uterus Fig. 90). By this means the instrument would f-retaining, and the cup attached below would nt the prolapse of the cervix. The spring should e of a sufficient strength to retain the instru- but under any circumstances it would be diffi- so regulate this that it would not prove a source itation. In finishing the instrument great care be taken to round off the edges, and especially pper part of the cylinder. The stem portion l be made a little over two inches and a half in , if the uterus shortens to that depth when the n is on the knees and elbows. It will be necessary to nickel- the steel portions of the instrument to protect them from the of the secretions. I have for some time determined to try this f treatment on the first case coming under my observation, but so happened I have not met with a well-marked instance in l years. The presence of a foreign body in the canal may of prove of service in bringing about an alterative action, and the r which always exists in using stem pessaries in flexures of the would be absent here.

Fig. 90.



Self-retaining intra-uterine stem.

ce this condition may be regarded as one of atrophy (most of muscular fibre), the stimulus to be derived from the use of icity may prove serviceable in causing a development of new . As a continued local stimulant, for the same purpose, the aic current, established by the action of the secretions on plates

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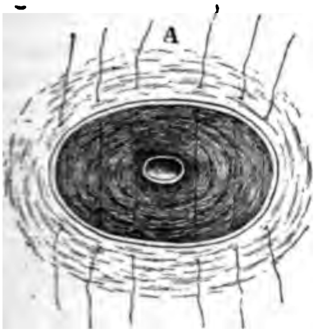
me at a regular interval for years, that I might study these changes. From observation, I do not hesitate to affirm that it is only as a rare exception to the rule that these evil consequences do not follow every amputation of the entire cervix, and especially so whenever the surface has been left to heal by granulation.

Amputation of the uterine neck was an operation which had been long practised by French surgeons, but Huguier at quite a recent date has brought the operation into greater prominence. The cervix has been removed, according to the fancy of the operator, with the knife, écraseur, or by the galvanic cautery, for supposed elongation, and for the relief of procidentia. But under all circumstances the stump has been usually left to heal by granulation, a process which requires from four to six weeks.

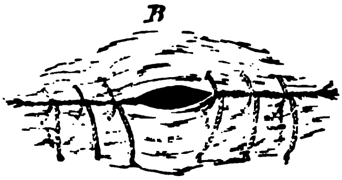
During the autumn of 1859, Dr. Sims made a most valuable contribution to the surgery of the cervix by covering the stump with vaginal tissue. In this way he obtained union by the first intention, and in my estimation an incalculable benefit was secured by thus preventing the formation of cicatricial tissue. In Fig. 91, *A* represents the stump from which the cervix has been amputated just at the vaginal junction. The sutures have been introduced so as to take up a sufficient amount of vaginal tissue along the edge, but not to include any portion of the cervix. When these sutures are secured, as shown in Fig. 92, at *B*, the vaginal tissue will be drawn without difficulty over the stump in a manner similar to that in which the soft parts are brought together in a circular amputation of the arm or leg. Whenever the neck has been removed with a clean cut, by the knife or scissors, and the stump covered, there can scarcely be any undue

Fig. 91.



Stump after amputation of the cervix.

Fig. 92.



Flaps secured by sutures.

contraction of the uterine canal afterwards, since the tissues can only heal up to and around the edge, thus leaving the canal of the same diameter as before the operation.

It has been already stated that I do not advocate the entire removal of the cervix under any circumstances except for malignant disease. As the members of the profession become more expert in recognizing the different conditions resulting from laceration of the cervix, the operation will become confined more and more to the limit I have indicated.

We may occasionally meet an instance of a class of cases quite common some years ago, in which the cervix is found enlarged, every mucous follicle destroyed, and the tissues white and as dense as an ivory billiard-ball, owing to the long use of the nitrate of silver, or the actual cautery. These cases would be apparently legitimate ones for amputation, if the procedure should be employed for any class not malignant, and yet even with these the operation is unnecessary. I have invariably obtained in such cases every advantage, without the disadvantages, of amputation, by simply removing, in the most superficial manner, with a pair of scissors, what was the mucous and submucous tissue, and then covering the denuded surface with the vaginal tissue as practised by Dr. Sims. As we thus remove the source of irritation, which was the cicatricial or dense tissue, we will obtain as full a revulsive effect as if the entire cervix had been amputated. We, moreover, thus transplant, as it were, a new set of mucous follicles, bloodvessels, and absorbents, which will, in time, bring about a remarkable change to a healthy condition of the deeper tissues.

The lateral tension, which is exerted as soon as the sutures have been secured, will generally be sufficient to arrest any bleeding. If, however, oozing should continue, a very moderate-sized compress in the vagina for a few hours will be sufficient to control it, since the tissues in contact with the freshened surface adhere very rapidly. The after-treatment is in every respect similar to that advised for the operation of uniting the lacerated portion of a cervix uteri.

Dr. Isaac E. Taylor, of this city, has employed the cobbler's stitch in the place of the interrupted one for bringing together the flaps after amputation of the cervix, and at one time it was known as the "Taylor stitch" instead of the usual term.

CHAPTER XXVI.

MALIGNANT GROWTHS OF THE UTERUS, VAGINA, RECTUM, AND EXTERNAL ORGANS OF GENERATION.

Definition—Varieties—Etiology—Rare among Negroes—More common among the richer than among the poorer classes—Tables XXXVIII. and XXXIX.—Sarcoma—Corroding ulcer—Prognosis, Diagnosis, and Treatment.—Cancer of external organs of generation and rectum.

MALIGNANT growths of the female sexual organs differ from the malignant growths of other parts of the body in no feature other than what may be due to the peculiar nature of the tissues in which they are located.

The term malignant is intended to express not only the fatal character of these growths, but it implies also that they tend to return after extirpation, and to disseminate themselves in other and perhaps remote parts of the body. They are all characterized by the great destruction of tissue which they cause.

There is little room now for doubt that the origin of these growths is local, and that they depend for their production upon some form of perverted nutrition. Frequently, with epithelioma at least, the growth follows an effort of nature to repair or remove the consequences of an injury received in childbirth. It cannot be questioned that for a period, more or less lengthy, after their appearance, they remain purely local affections. If recognized at this stage, in a locality within surgical access, it is not too much to hope that they might be fully eradicated. Unfortunately, however, they tend rapidly to involve contiguous parts, and to disseminate themselves throughout the system by means of the lymphatics and bloodvessels. This cancerous material becomes arrested in the lymphatic glands, beyond which, if it could pass, it might be eliminated or thrown out from the system. When thus arrested in the lymphatic glands it clogs them up and so destroys their function. This poison may lie dormant for an indefinite period in these glands, there forming so many foci of infection, and long before any unmistakable sign of their existence can be detected. As the infection spreads through the body the disease becomes constitutional. This stage is to be recognized by the "cancerous cachexia," of which the many symptoms are a loss of blood, septicæmia, pinched features, and a peculiar sallow or straw color of the skin. Yet this does not always occur, for instances are occasionally met with where these do not appear even in the last stages of the disease.

Gynæcologists, as well as writers in other branches of medicine, have been much confused in classifying malignant growths. Clinically it is hardly important to recognize but a single class, but there are histological differences which mark the various growths, and it is best to look at them from this point of view.

The following table shows the various forms of malignant growths met with in gynæcological practice.

- Malignant growths.
  - Cancer.
    - Encephaloid or medullary.
    - Colloid.
    - Scirrhus or hard.
    - Epithelioma.
  - Non-cancerous.
    - Sarcoma.
    - Myxoma.
    - Corroding ulcer.

Encephaloid, colloid, and scirrhous growths are rare forms; scirrhus particularly so; and I believe that many so-called cases of scirrhus are only instances of hardness of the cervix induced by inflammation, and from the too frequent application of caustics, or the cautery.

EPITHELIOMA is much more common. It usually springs from the mucous membrane on the cervix, from the canal below the internal os, or from the glandular epithelium. Epithelioma is also known as papilloma, and as cauliflower excrescences. Some forms of papilloma are not malignant. The papillæ or villous projections from the epithelial surface of the mucous membrane are formed by the expansion of the ultimate twigs and loops of the vessels and nerves. From these papillæ springs this disease in its first growth. They enlarge by the rapid increase in size of their bloodvessels, which become looped upon themselves. These growths continue to be covered by a thickened mucous membrane until they begin to break down by ulceration. They are club-shaped, and as they shoot out in every direction they present in outline the appearance of a cauliflower growth. Within the meshes of this villous tissue may now be found new cells of all sizes and shapes, thus indicating by these characteristics their rapid growth.

SARCOMA, although histologically differing from the cancers proper, is no less malignant, and clinically is hardly to be distinguished from some of these forms. It originates in the connective tissue of the uterus; it has its seat generally near the fundus, and is seldom, if ever, found below the internal os.

MYXOMA is probably never malignant, except when associated with some other growth of a malignant character, as myxo-sarcoma. A variety of myxoma is found in the hydatiform degeneration of the chorion, but we seldom have to deal with this.

CORRODING ULCER has its beginning, so far as my observation extends, on the vaginal surface of the cervix, and while it may involve the uterus, it extends chiefly on the vaginal walls and on the external organs of generation.

Epithelioma, and other forms of malignant disease, and even sarcoma, may coexist, and run their course separately, but this is exceedingly rare. For although the growth may seem to be confined to the cervix, the tissues above will have already become infiltrated, and in turn break down, so that no line can be drawn, and none exists, between the ulcerating surfaces. These cancerous deposits always begin to soften, or break down in their centre. As they increase in size, inflammation becomes established in the neighboring connective tissue, resulting in the formation of abscesses, which include these cancerous deposits. A number of these abscesses come together, by destroying the intervening tissue, after which they break and discharge their contents, leaving a sloughing surface exposed. New tissue is constantly becoming involved by infiltration, so that the sloughing process extends, while from its surface, in the attempt at repair, new growth is continually springing up, to be in turn rapidly destroyed.

For definite information as to the intimate structure of the various forms of malignant growths, reference must be made to works on morbid pathology.

ETIOLOGY OF MALIGNANT DISEASE OF THE UTERUS.

It has been shown by observers that the negro in this country is much less liable than the white woman to cancer of the uterus. This is unquestionably true, and I can add my professional experience in corroboration of it, since I have known but a single negro woman, and she a mulatto, who had cancer of the uterus. My own belief is that cancer of the uterus is to be found more frequently among the better classes than among the poorer ones, and that white women of this country are afflicted with this disease to a less degree than the women of older countries.

Two thousand one hundred and fifty-three women were admitted to the Woman's Hospital[1] with various diseases, of which number sixty had malignant disease of the uterus, this being 2.78 per cent. on all admissions. Two thousand four hundred and forty-seven women in my private practice suffered from different sexual disorders, of which but fifty-three cases, or 2.19 per cent., were cancers of the uterus.

Within the past five or six years some restriction has been placed on the indiscriminate admission of these cases for treatment at the Woman's Hospital. This was done in consequence of inadequate accommodations, and, while the restriction may have made some difference, it could be but slight. For all cases have been received regularly when they could be placed in a general ward without annoyance to others, provided there was any reasonable hope of relief from an operation. But in my private practice there existed nothing of the kind, and I was as likely to be consulted for cancer of the uterus as for any other disorder peculiar to women. We may, therefore, accept this average as a fair one, as taken from a class who were in prosperous circumstances and native born, for the exceptions as to birth are too small in number to affect the average.

We must admit our lack of any positive knowledge in regard to the causes of malignant disease of the uterus. But that epithelial cancer arises frequently from perverted nutrition, in the attempt to repair injury, cannot be questioned. Those who suffer from this form of cancer about the time of a change of life are, without exception, from a class who have enjoyed more than the average degree of health. Another feature, and a most important one for our present purpose, is the fact that the average number of children borne by these women is always much above the usual one. In connection with these facts I will place on record the statement to the effect that I have never known a woman to have any form of epithelial cancer of the uterus unless she had at some time been impregnated. Moreover, I believe that nearly all if not all cases of epithelioma, or cauliflower growth, have their exciting cause or origin in a laceration of the cervix. It springs from the effort to repair a local injury, as I have previously stated, and may develop from a recent laceration, or it may occur after a change of life.

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[1] Twenty-second Annual Report of the Woman's Hospital of the State of New York, containing Dr. John N. Beekman's Report.

A mass of granulations may spring from the surfaces of a recent laceration, as from any other ill-conditioned sore, when due to the state of general health, or to any other cause. Upon this foundation epithelioma may become developed, from perverted nutrition, after the first child, and early in life. That such a growth would be more liable to develop in after life can be readily explained on physiological grounds. An entire change is attempted to bring about a condition in the uterus fitting it for the quiescent state in which it is to remain during the after period of life. To accomplish this the mucous follicles undergo atrophy, and the supply of blood gradually diminishes. The existence of an old cicatricial mass, such as would have been thrown out in early life between two lacerated surfaces to prevent their rolling out, will now retard the process. Frequently, such a mass will be entirely removed, as I have noticed, with great interest, and nature will even undertake, at this period of life, the same task in the vagina. But the natural change in the uterus is sometimes retarded by this extra duty, and, as a source of irritation, this leads to a fresh supply of blood being sent to the parts, now no longer prepared to receive it. The consequence is a new growth is stimulated on this epithelial surface, which has already undergone marked changes in its character. This growth may be at first benign, but becomes malignant and more extended by striking its roots deep into the uterine tissue, in quest of needed nutriment which the mucous membrane itself cannot now supply.

Fifty-one women in my practice had all borne a number of children; the other two had suffered from the effects of criminal abortion early in life, and remained sterile afterwards. Among the sixty patients treated for malignant disease in the Woman's Hospital there were included four cases of sarcoma. Of the total number six were unmarried (no questions were asked as to previous pregnancies), while nine were reported as sterile, but many had been impregnated. We will, therefore, exclude the sterile women, as the probabilities were all in favor of a miscarriage or criminal abortion. With the private history of two of these unmarried women I happened to be conversant, and sent them to the institution. They were about forty years of age, and had both acknowledged to me that they had been pregnant, and had submitted to a criminal abortion early in life, from the effects of which they had never recovered. The others were not in my service, and may have suffered from sarcoma.

With our present limited knowledge on this subject I should be sorry to be instrumental in establishing the rule that epithelial cancer of the uterus was proof beyond question of a former pregnancy. No rule we are told is without exception, and this may not be an exception to the rule. One fact, however, we may accept beyond question, and that is the occurrence of this form of malignant disease in a woman who has never been impregnated must be exceedingly rare.

This fact, together with the large average number of children borne by these women, increases the circumstantial evidence in favor of the supposition regarding the consequences of lacerations of the cervix.

CASE XX.—Some seven years ago, Dr. Noeggerath, of this city, sent a case of cauliflower growth to the Woman's Hospital for operation. She called at my office for a permit, and I examined her. It so happened that I was particularly pressed for time, and in making a hasty examination I caused a most profuse hemorrhage. I made various applications without arresting the bleeding, until at length I placed her on the knees and elbows so as to be able to bring the whole growth into view, over the surface of which I placed with a spatula more than a large tablespoonful of the subsulphate of iron, or Monsel's salt, and a tampon over it. She was directed to inform the House Surgeon to remove this dressing on the next day, but she neglected to do so, and it remained in from Friday morning until the following Thursday afternoon. The Assistant Surgeon, Dr. Harrison, learning from her the nature of her malady, did not make an examination, through fear of causing hemorrhage. He simply directed his attention to her general condition until she should be seen by me in the regular routine. To my astonishment, when I removed the dressing, the mass of granulations had disappeared, showing a well-marked double laceration of the cervix. She was two or three months under preparatory treatment for the purpose of reducing the size of the uterus and for healing the torn surfaces. Afterwards the lacerated portions were united, and she was discharged with the uterus in a natural condition. I am under the impression that she visited the hospital about eighteen months after the operation, and was perfectly well. This result might have followed under ordinary circumstances even with true epithelioma; but the previous existence of the laceration is the point I wish to present.

This case first drew my attention to the probable connection between laceration and epithelioma, and since then I have over and over again verified the existence of the injury. In fact I have never failed to detect the laceration with the finger, unless the disease had so far advanced as to already involve the vaginal surface.

es of non-malignant papilloma, or epithelioma, which is some- termed cancroid, is found occasionally sprouting up from ted surfaces of a cervix, like a mass of granulations. To the pearance is like that of cauliflower growth at an early stage pment. But the mass is softer and less friable to the touch ue epithelioma in the condition we generally see it for the . The question of malignancy is only determined by the its attachment, as has been already described, when it be- rade the deeper tissues. This change may take place at and the short period before it occurs constitutes the only ich cancer in any form may be said to be local.

XXXVIII. gives the earliest and latest age, at time of , of those who had cancer of the uterus, together with the r each period of ten years. For the private patients the ge on admission was 43.01 years; for those in the Woman's nly an approximation is given in the table. For the private he average age at puberty was 14.43 years, being a little fe than the general average; that of marriage was 19.41

XXXVIII.—*Age at time of admission of those who suffered from Malignant Disease of the Uterus.*

ate Hospital.	Number for each period.	Woman's Hospital.	Number for each period.
at admission.		Age at admission.	
. . . . .	3	23 to 30	6
. . . . .	18	30 " 40	12
. . . . .	21	40 " 50	21
. . . . .	5	50 " 60	16
. . . . .	6	60 " 67	4
otal	53	Total	59

Woman's Hospital Report the number of children is not d Table XXXIX. is taken from the records of the private The number of children ranges from one to ten, and there rtain number of miscarriages. Thus there were 9 women l child each, and 7 of these women had also 1 miscarriage ad but 2 children and 1 miscarriage each; 10 had 3 chil- , and 12 miscarriages in all; 2 women had each 1 miscar- no children; and 11 women, who had only 1 child each, [illegible] times, etc. In the aggregate, 51 women had [illegible] miscarriages, making an average of 4.47 children, [illegible] miscarriages for each. Finally, the average number of [illegible] of the 53 women was 5.16 each, which is nearly [illegible] average.

[illegible]—Showing number of Pregnancies among 53 Women [illegible] Disease of the Uterus (Private Hospital Report).

	Number of children per mother.										Total.	Average.
	[illegible]	[illegible]	[illegible]	4.	5.	6.	7.	8.	9.	10.		
[illegible]	[illegible]	[illegible]	[illegible]	6	5	3	5	5	1	3	51	
[illegible]		[illegible]	[illegible]	[illegible]	25	18	35	40	9	30	228	4.47
[illegible]		[illegible]	[illegible]	[illegible]	....	6	7	..	..	..	44	[illegible]
[illegible]	[illegible]				....	....	..	..	..	..	2	
[illegible]				.	....	....	..	..	..	..	2	1.00
	[illegible]	[illegible]	[illegible]	[illegible]	5	3	5	5	9	3	53	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	24	42	40	9	30	274	5.16

[illegible] an average of 13.87 years had elapsed since [illegible] Nineteen, or 35.84 per cent., had already gone [illegible] at the average age of 44.95 years, the [illegible] the earliest 39, and 52 years for the latest. The [illegible] time since the first symptom of the disease appeared [illegible] months, the range being from 2 months to 8 [illegible] 1 each for 8, 6, and 5 years; 3 for 3 years; [illegible] 1 year; and the remainder were below this [illegible] cases was confined to the cervix, in 3 in- [illegible] and in the same number to the posterior [illegible] both lips were involved. In 21 women the [illegible] was the seat of the disease. In 13 cases the [illegible] to the uterine cavity, and in 8 it had also ex- [illegible] The cavity of the uterus, the cervix, and [illegible] involved in 5 of these cases, the bladder [illegible] and the rectum in another.

[illegible] Hospital, when the cases of sarcoma were ind, the disease was found situated in the body of the uterus in stances, confined to the cervix in 27, and both body and cervix ved in 23.

PROGNOSIS.

ifortunately, we have as yet no means of doing more than to t temporarily the progress of the disease, which leads inevitably ath. A few cases are on record where the uterus, and diseased s about it, all sloughed away, through the efforts of nature, recovery. This process has been accidentally established during ourse of treatment, and with the same fortunate result, in several ces. Cases of cure have been also reported as the result of cal interference, when no return of the disease occurred. But the chances so much against a probability of cure, we must hold n some there were mistakes in diagnosis. I have had two ines where over five years had elapsed after the operation to the when I lost sight of them, and there had been no return of the se. Yet I am fully satisfied that I committed an error as to the osis. I am led to this opinion from the fact that in every ce where, at the time of the operation, no doubt existed as to ature of the malady, it has returned.

e tenacity of life sometimes shown in this disease is remark- Dr. Barker[1] had under his care a lady who lived in good h for nearly twelve years after he had detected the existence ncer in the uterus. I have just referred to cases passing under bservation where the disease had existed for eight, six, five, three, and one years, according to the statements of the patients. If could be relied upon as to the beginning of hemorrhage and ive discharge, the disease returned, on an average, two years they had been operated on. There seems to be a great differof opinion among observers as to the duration of this disease. I not been able to keep any reliable data on this point, but my ssion is the disease returns on an average of two years after ral, and that it runs its course in about three years.

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[1] me Clinical Observations on the Malignant Diseases of the Uterus, by For- Barker, M.D., American Journal of Obstetrics, Nov. 1870.

[illegible] OF MALIGNANT DISEASE OF THE UTERUS.

[illegible] symptom which will lead to an investigation [illegible] caused by the first breaking down of [illegible] has opened. This process is early [illegible] discharge, which becomes exceedingly offen- [illegible] assumes a greater consistency as the tissues break [illegible] matter escapes.

[illegible] should be made with unusual care when- [illegible] to be suffering from malignant disease. [illegible] a profuse hemorrhage will always occur, [illegible] examination can be made under almost all [illegible] any loss of blood, this should not be allowed to [illegible] necessary to pass the back of the finger along the [illegible] vagina, while at the same time the perineum is [illegible] the view of introducing air into the vagina, and of [illegible] the neck of the uterus without touching it. If the [illegible] by an enlarged cervix, or a mass be felt growing [illegible] be applied gently to the surface without injury. [illegible] been so well advanced in the vagina, it is able to [illegible] by simply touching it. The examination unfortu- [illegible] made by pushing the finger into the passage, and [illegible] through the thin covering to the bloodvessels.

[illegible] exists, a rough friable mass will be detected, [illegible] will resemble nothing else. Other growths re- [illegible] appearance, as I have pointed out, but they are soft, [illegible] the sensation as if portions of the mass could [illegible]

[illegible] already made any advance, we will find the organ [illegible] the pelvis, from inflammation which has been [illegible] tissue by cancerous infiltration. Should the [illegible] have begun, the finger will be able to pass directly [illegible] formed below the internal os, which has already in- [illegible] The disease necessarily confines itself to the cervix, [illegible] membrane is not found above the internal os. [illegible] of the vagina will be found filled with a thin, greasy, [illegible] portions of broken-down tissue, the smell [illegible] marked that it will never be forgotten after it has been [illegible] After the diagnosis has been made as to the char-

acter of the disease, the next most important point to determine will be the extent of the malady, for on this will depend the course of treatment to be followed. If it should so happen that the disease has not yet reached the vaginal mucous membrane, but is still confined to the cervix, the case would be an excellent one for amputation. Should the vagina have become involved, the uterine cavity somewhat excavated, the organ fixed from more or less cellulitis, with enlargement of any of the lymphatic glands, to be found generally behind the uterus, and to either side of the pelvis, we can only palliate the trouble. After completing the examination the physician will urgently desire to get rid of the smell upon his hands. I know of nothing but time, literally, and a solution of thymol which will accomplish it. The solution, as made for the spray apparatus, to be used during the operation of ovariotomy, will answer, or even a stronger one might be better, and it should be kept in the office for such purposes. A solution of carbolic acid will of course neutralize that from the cancer, but, in my opinion, there is little choice as to odor between this and the cancer.

In this disease there should be no delay in operating, and the patient should always have the benefit of a doubt and be relieved of any suspicious growth. Whenever this is limited to the cervix sufficiently to warrant its removal by amputation, it should be done with the scissors or the knife. The écraseur or galvanic cautery wire should not be employed for the purpose. If we are able to get into healthy tissue by removing the neck at the vaginal junction, we should aim to leave the parts in as healthy a condition as possible. This is not to be accomplished by allowing the surface to heal by granulation. I have already pointed out the consequences of reflex irritation excited by a cicatricial mass being formed on erectile tissue. Tissue of this character is of so low a grade of vitality that it would be likely to offer a better starting-point for a recurrence of the disease than would be found in more highly organized structure. It is, therefore, good practice to make a clean amputation when we can do so, and to cover the stump by sliding the vaginal tissue over it, and securing the edges of the flaps with sutures. This procedure has been fully described under the head of amputation of the cervix, and the full details of after-treatment will be found in the same connection.

Should the disease have advanced already so far that the woman may be judged to have comparatively no future, then the more thoroughly the diseased tissues can be destroyed by the use of the

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Should the disease have advanced already so far that the woman may be judged to have comparatively no future, then the more thoroughly the diseased tissues can be destroyed by the use of the

cautery the better, for we thus employ the best means at command to prolong life.

The patient is to be placed on the left side, as for an examination, and the largest-sized Sims's speculum is to be used. I first remove rapidly, with the scissors, as much of the growth as I can, and then employ either Thomas's wire scraper, or Simon's curette, or scoop. Dr. Sims's scraper has too sharp a cutting edge, and causes much bleeding. With some one of these instruments, all of this diseased tissue must be scraped away until apparently healthy tissue has been reached. The loss of blood is often very great, but it can be held in check by the assistant making pressure with a sponge probang against the bleeding vessel. Or several long artery forceps may be used to secure temporarily the mouths of the larger vessels. Even at the expense of considerable bleeding this work must be thoroughly done, for a partial removal would only be a fresh stimulus for a new growth. In fact, unless the operation be thorough, we will have been the means of shortening the life of the patient. After all the diseased portion has been removed, the cautery must be applied over the whole raw surface. The actual cautery is not efficacious, as there are no means of keeping up the white heat, and I have thought that the tissues contracted more and became more dense after its use than after any other application. The galvanic cautery is better, but the same objection, in a degree, exists in regard to keeping up the temperature.

The best thermo-cautery for the purpose which I have ever employed is Paquelin's instrument as made by Charrière in Paris. Here the platina cone extremity is easily kept at white heat by forcing atmospheric air into the midst of a flame of benzine vapor, and the white heat is maintained with but little impairment even in the midst of profuse bleeding.

After this operation, the whole surface must be covered by a thick pad well saturated with glycerine, and a moderate-sized tampon placed over all, even if there is no indication of bleeding. The necessity for this every one will learn by experience, and I would urge its importance in every case. The patient must be placed in bed, and not disturbed until the second day, when the tampon should be removed, but not the pad which was placed in contact with the raw surface. This must be left until detached by suppuration, for if removed by force, violent hemorrhage would result. About an ounce of glycerine thrown in with a glass syringe, along the sides of the vagina, when the cotton sticks to the edge of the denuded surface, will aid in loosening it. Five or six hours after applying the glycerine, a vaginal injection of warm water will generally be sufficient to loosen this mass of cotton so that it can be taken away without difficulty. As soon as suppuration begins, which will be indicated by the increased discharge, the injections are to be employed several times a day until it ceases. More will depend upon the proper use of these injections than upon anything else. If the fetid discharge can be checked by keeping the vagina clean, and a healthy granulating surface established on the stump, there will be a great improvement in the appetite and appearance of the patient. In fact, after such an operation, it is sometimes difficult to divest one's self of the impression that the patient has not been entirely restored to health.

It is remarkable, both as to the extent of tissue which can be sometimes removed in these cases, and as to the degree of tolerance that the system evinces to such a procedure.

Case XXI.—Some years ago, Dr. Wm. H. Van Buren, of this city, saw a case from Baltimore, in consultation with me, and was present at the operation. This lady was about sixty years of age, and had had several hemorrhages from the vagina, before consulting me.

The finger passed into a short vagina, about two inches deep, at the bottom of which was felt a mass of cauliflower growth, involving the neck to the vaginal junction, where the passage terminated in the absence of a posterior cul-de-sac. By the introduction of the finger into the rectum a body was felt as if it were the retroverted uterus somewhat larger than would have been expected at her time of life, but I committed a great oversight in not completing my examination by a conjoined manipulation. In this mass on the cervix I detected a small opening which was apparently the os, but the probe was not introduced through fear of exciting bleeding, and from the fact that I felt thoroughly satisfied with my investigation of the case.

I anticipated no difficulty at the operation, intending to cut off only what I could of the cervix as a palliative procedure, and then cover the stump. As soon as I cut into the supposed neck I found that I had made a mistake in diagnosis, and that I was short-handed for the kind of operation before me. The bleeding was excessive from the beginning; there was no alternative but to continue to remove the growth, until I should reach comparatively healthy tissue. Before this was done the vagina and uterus had opened out into one immense cavity which was like a flaccid bag. I was unable to recognize any part of the cervix, but I began to remove the growth which had been mistaken for the uterus, and which was adherent to the vaginal walls, and filled the posterior cul-de-sac.

This I followed around and into the uterus, until there remained of the organ nothing more than the thinnest shell. I used scissors, the curette, and finally the handle of one blade of a pair of long scissors, which could be disjointed, and it proved an admirable instrument for the purpose. The loss of blood was fearful; it was sponged away by the assistant as rapidly as possible, but the quantity was so great as to run from the table upon the floor. Her life was in jeopardy, and I felt that there could not be more than a temporary security in a tampon on such a surface.

From a short distance within the mouth of the vagina I began, with a needle having a long silk loop attached, to go around this cavity in the axis of the vagina, and back to the opposite side, taking up what tissue I could at about the distance of every inch. I introduced six or seven of these running strings, radiating like the sticks of a fan, a long silver wire being attached to each, and drawn through. The two ends of the suture nearest to the bladder were first seized in one hand and held, making traction as the tissues were being slid together by the finger of the other hand. As soon as the parts were drawn up tight together in this manner, the ends of the sutures were twisted, bent flat, and cut off short. One after the other was thus secured from above downward, so that the blood was all driven out, and there could be no accumulation. The hemorrhage was thus arrested permanently by having each portion of raw surface folded in close contact with some other part. The result was that the uterus and vagina were all drawn up into a solid ball, in which, to my surprise, union took place throughout by the first intention. I could only find afterwards two or three of the shorter sutures, and the patient carried the remainder to her grave. She lived scarcely two years after the operation, and died from a return of the disease in the neighborhood of the bottom of Douglas's cul-de-sac, extending thence into the rectum. Her life was prolonged by the operation and saved by this method of bringing the surfaces together. She would have died of hemorrhage if the attempt had been made to control it by a tampon, for bleeding would have come on each time it was removed.

The frequent use of vaginal injections will greatly lessen the odor, but cannot remove it entirely. The smell of the carbolic acid is almost as disagreeable as that from the cancer, yet it is invaluable as a disinfectant, and should be added to each injection. In the use of a solution of thymol for injections in cancer, I have had an experience limited to a single case only, and I know of no one else who has employed it for the same purpose. It will prove, I am fully satisfied, a most valuable agent for correcting the smell of cancer, while it is a perfectly safe remedy and unirritating. The proper strength has not yet been determined, but it will be needed, I think, in a more concentrated form than the formula given to be used in the spray apparatus. I have directed a few ounces of this strength only to be thrown into the vagina after each injection, and the effect has been marked. A solution of the permanganate of potash is a good deodorizer, but it is liable to undergo chemical change, and should be freshly made, otherwise it may be very irritating.

To check any unexpected bleeding which may come on, I direct that a saturated solution of alum shall be kept by the patient to be injected at any time. An ounce or two thrown into the vagina while the patient is on the knees and chest will prove very effectual. Whenever the woman is strong enough to remain for a few moments in this position, it will be better for her, as the alum is thus kept longer in contact with the bleeding surface. Afterwards she must lie quiet on the side for a while.

Whenever an injection is administered with the patient lying on the back, the nozzle must be introduced with as much care as is the finger for making an examination. And until the passage has become distended with the water it should be injected without force, through fear of causing hemorrhage. Sometimes a piece of rubber tubing drawn over the nozzle and made to project an inch beyond, with a few holes on the sides, will be a great protection. The temperature of the water used for these injections should always be elevated, unless there should exist some reason to the contrary. For the high temperature will be particularly serviceable in checking bleeding, and in lessening the supply of blood circulating in the parts.

The thorough application of Churchill's tincture of iodine, to the entire surface of the cancerous mass, is frequently very useful in arresting hemorrhage, and seems to have the effect of temporarily checking the extension of the disease.

Sometimes one of the earliest symptoms of cancer will be present in the form of pain about the pelvis, but, as a rule, it is only when the disease has advanced that the patient begins really to suffer. It is incumbent on the physician to use his best judgment in the administration of anodynes in such a disease as this, and the patient should not be allowed to suffer through the fear of becoming dependent on them. They must be allowed, and as the disease advances the patient must receive relief regardless of the quantity. A great deal may be accomplished if the selection of the agent and dose be so regulated as to gain the needed effect without disturbing the stomach or appetite. The skill of the physician will be tested in accomplishing at first all that may be required by some of the milder remedies, changing from one to the other at the proper time. Chloral will agree with a large number of persons, and answer every purpose better than any other remedy, and this is about the only disease in which I ever employed it without the fear of serious consequences. Towards the close of the disease, morphine by injection under the skin, and by suppositories in the rectum, will have to be freely employed.

DIAGNOSIS AND TREATMENT OF MALIGNANT DISEASE OF THE UTERUS.

Generally the first symptom which will lead to an investigation will be a sudden loss of blood, caused by the first breaking down of tissue in which a bloodvessel has opened. This process is early accompanied by a watery discharge, which becomes exceedingly offensive, and afterwards assumes a greater consistency as the tissues break down, and the cancerous matter escapes.

The vaginal examination should be made with unusual care whenever a woman is suspected to be suffering from malignant disease. Unless this rule is observed, a profuse hemorrhage will always occur, and, since a most thorough examination can be made under almost all circumstances without any loss of blood, this should not be allowed to happen. It is only necessary to pass the back of the finger along the posterior wall of the vagina, while at the same time the perineum is pressed back, with the view of introducing air into the vagina, and of getting beyond the neck of the uterus without touching it. If the passage be occupied by an enlarged cervix, or a mass be felt growing from it, the finger can be applied gently to the surface without injury. As the finger has been so well advanced in the vagina, it is able to examine every part by simply touching it. The examination unfortunately is too often made by pushing the finger into the passage, and this always breaks through the thin covering to the bloodvessels.

If an epithelioma exists, a rough friable mass will be detected, which to the touch will resemble nothing else. Other growths resemble this in appearance, as I have pointed out, but they are soft, and none of them give the sensation as if portions of the mass could be easily broken off.

If the disease has already made any advance, we will find the organ fixed more or less, in the pelvis, from inflammation which has been excited in the cellular tissue by cancerous infiltration. Should the ulcerative process have begun, the finger will be able to pass directly into a large cavity formed below the internal os, which has already involved the cervix. The disease necessarily confines itself to the cervix, as a rule, since mucous membrane is not found above the internal os. The lowest part of the vagina will be found filled with a thin, greasy, gruel-like fluid containing portions of broken-down tissue, the smell of which is so marked that it will never be forgotten after it has been once identified. After the diagnosis has been made as to the char-

acter of the disease, the next most important point to determine will be the extent of the malady, for on this will depend the course of treatment to be followed. If it should so happen that the disease has not yet reached the vaginal mucous membrane, but is still confined to the cervix, the case would be an excellent one for amputation. Should the vagina have become involved, the uterine cavity somewhat excavated, the organ fixed from more or less cellulitis, with enlargement of any of the lymphatic glands, to be found generally behind the uterus, and to either side of the pelvis, we can only palliate the trouble. After completing the examination the physician will urgently desire to get rid of the smell upon his hands. I know of nothing but time, literally, and a solution of thymol which will accomplish it. The solution, as made for the spray apparatus, to be used during the operation of ovariotomy, will answer, or even a stronger one might be better, and it should be kept in the office for such purposes. A solution of carbolic acid will of course neutralize that from the cancer, but, in my opinion, there is little choice as to odor between this and the cancer.

In this disease there should be no delay in operating, and the patient should always have the benefit of a doubt and be relieved of any suspicious growth. Whenever this is limited to the cervix sufficiently to warrant its removal by amputation, it should be done with the scissors or the knife. The écraseur or galvanic cautery wire should not be employed for the purpose. If we are able to get into healthy tissue by removing the neck at the vaginal junction, we should aim to leave the parts in as healthy a condition as possible. This is not to be accomplished by allowing the surface to heal by granulation. I have already pointed out the consequences of reflex irritation excited by a cicatricial mass being formed on erectile tissue. Tissue of this character is of so low a grade of vitality that it would be likely to offer a better starting-point for a recurrence of the disease than would be found in more highly organized structure. It is, therefore, good practice to make a clean amputation when we can do so, and to cover the stump by sliding the vaginal tissue over it, and securing the edges of the flaps with sutures. This procedure has been fully described under the head of amputation of the cervix, and the full details of after-treatment will be found in the same connection.

Should the disease have advanced already so far that the woman may be judged to have comparatively no future, then the more thoroughly the diseased tissues can be destroyed by the use of the

Diagnosis.—The earliest symptoms of sarcoma will be a watery discharge, then a frequent show, out of time, and free menstruation. The discharge has been compared to water filled with meat washings, and is not always offensive as with other forms of cancer equally far advanced. As a rule, there will be but little pain, except sometimes in the back, as might accompany any uterine difficulty. The cancerous cachexia and symptoms of blood poisoning come on at the last stages of the disease. A vaginal examination will only establish an enlargement of the uterus, with no indication of disease about the cervix. Until the uterus has been dilated sufficiently for the introduction of the finger, we cannot form a diagnosis, for every symptom may be due to a uterine polypus undergoing disintegration.

When the finger can reach the fundus, nothing may be detected but a small soft mass of granulations, not unlike epithelioma in its early stages, but of different density. In the recent development of the disease this growth may be mistaken for the granulations which are frequently found in women who have had a number of children. The microscope may establish the diagnosis by detecting the presence of what are termed the spindle-shaped cells of sarcoma, each containing one or more large oval nuclei. The same general rules are applicable for the treatment of sarcoma that have been already given in full for other forms of malignant disease.

Certain points in diagnosis, and regarding the general history, have not yet been fully given, being withheld to be presented in connection with the following cases.

CASE XXII.—Mrs. H. B. S., aged 29, sterile, was admitted to my private hospital July 28, 1863. She menstrated first at the age of 16 years, and was never regular afterwards. Previous to her marriage, at 19, she had menstruated but three times. Shortly after marriage she began to suffer from hemorrhages at irregular periods.

I found the uterus enlarged from a fibroid in the anterior wall, but as this growth was too small to account for the size of the uterus, I dilated the canal with a sponge tent for a few days after her admission. I found a fibrous polypus about an inch and a half in diameter, attached by a short pedicle to the fundus, and I removed it without difficulty. For two years she menstruated naturally as to quantity. By degrees this became more free, until at length, in the summer of 1867, while at Beaufort, South Carolina, where her husband was stationed, she consulted Dr. Stewart, who removed a second tumor which was soft and filled the cavity.

Dec. 21, 1867, she was admitted to the Woman's Hospital. I found a soft growth as large as a hen's egg springing from nearly the whole anterior wall, and filling the canal. Dr. Clymer, who was then connected with the institution, made a microscopic examination, and pronounced it a recurrent fibroid.

23*d*. I removed the whole mass in a most thorough manner down to apparently healthy tissue, by means of scissors and a scoop. Then Churchill's iodine was freely applied throughout the whole canal, with the effect of causing the uterus to become greatly reduced in size. She recovered from the effects of the ether, readily, and there occurred nothing special to mark her case.

26*th*. Vaginal injections were used several times a day and continued from the first discharge after the operation. She made a good recovery, and went home Jan. 11, 1868.

I was informed afterwards that the growth soon returned, as was made evident by the recurrence of the hemorrhages, and she died Oct. 13, 1868.

If we can ever be certain of the existence of a fibroid in the uterine walls, I was as to this tumor, which I detected between three and four years before Dr. Stewart's operation for the removal of the sarcoma from the site of the fibroid.

CASE XXIII.—Mrs. E. D., aged 35, was admitted to the Woman's Hospital Oct. 15, 1867. Menstruated first at 15, was generally regular in both time and quantity until the commencement of her present difficulty. Married at 23; had had one child and five miscarriages. Four years and a half previous to admission she began to suffer excruciating pain during the menstrual period, and at the same time from menorrhagia. She received no treatment, but on the 25th of September, 1866, something seemed to burst from her, and a large mass came away per vaginam. On examination this was pronounced a hard fibroid, which had become enucleated spontaneously. For three months afterwards. she was perfectly well, but she then began to flow again.

July 19, 1867. Drs. Peaslee and Sabine removed another growth from the uterine cavity, which was supposed, at the time, to be an ordinary fibrous polypus. There was but little improvement after the last operation.

Oct. 21. I dilated fully the uterine canal, and found a soft mass springing from the fundus by a broad base. The patient was placed under the influence of ether, and I removed the entire growth with but little bleeding.

A portion of this tumor was examined by Dr. Francis Delafield, who stated that "the tumor clearly belonged to the class of tumors described by Virchow under the name of medullary sarcoma. Such tumors growing from the mucous membrane of the uterus have been observed at times, but are not common. The prognosis of such a tumor is bad, less so on account of secondary growth in other organs, than on account of its certain local recurrence and the consequent general exhaustion of the patient."

Nov. 8. The condition of the patient had improved sufficiently for her to return home. The record of her case gives no further history, as she probably never returned to the hospital. My impression is that she died shortly after her return home.

CASE XXIV.—In June, 1874, I was sent for to remove a uterine tumor from a woman residing in Stockholm, N. J., and was accompanied by Drs. Bache Emmet and Alfred E. M. Purdy to assist me. I had taken it for granted that I would find the uterus dilated for the operation, but this had been neglected. The distance was too great for me to return, and it was necessary to do something speedily to check the loss of blood to which she was liable. I had her placed under ether, and on the back; then, while steadying the fundus of the uterus with one hand over the abdomen, I commenced rapid dilatation by means of my index finger. This was the first time I ever attempted it, but I soon succeeded in working the finger up to the fundus. I then felt a soft mass of granulations, not larger than the end of my finger, and not pedunculated. These were easily removed with the finger-nail and with a pair of forceps I have for the purpose of taking away other granulations from the uterine cavity. The case then seemed of little importance; but she again had hemorrhages during the summer, and was admitted in consequence to the Woman's Hospital October 15, 1874, with the following history:—

Her age at that time was 42. She had menstruated for the first time at the age of 18, and had been regular afterwards. She had married, and was sterile. Her health had been good until four years previous to her admission, when she began to flow, and then had a continuous show for twenty-three weeks. Her appearance had greatly changed since I had seen her in June. She was now sallow and cachectic; had had several chills within a fews weeks before entering the hospital; and was then too weak to sit up all day.

The uterus was dilated; she was seen by Dr. Sims in consultation, and an operation was decided on. Ether was administered, and, without further delay, I removed with forceps, and afterwards the curette, a soft mass, as large as an English walnut, from the same point of the fundus from which I had before taken it away. The bleeding was very profuse, but it was arrested promptly by throwing hot water into the uterus and by freely applying iodine afterwards. Until October 30 an elastic catheter, attached to a syringe, was passed to the fundus daily, and the cavity thoroughly washed out with warm water and a little carbolic acid. As the discharge was rather more profuse than is usual two weeks after such an operation, iodine was freely applied to the fundus by means of the applicator and some cotton.

Nov. 1. At 2 A.M., just twelve hours after this application, she was seized with a severe chill, and died at 8 A.M.

The post-mortem examination was made about seven hours after death. The beginning of a local peritonitis was evident from the agglutination of the intestines about the uterus. When these were separated, which was easily done, it was shown that a portion of the fundus had begun to slough, and around this was a well-marked line of demarcation. Although soft, this plug was lifted out, by a little traction, from the uterine wall, leaving an opening about an inch in diameter. The inner face of the plug was the limit of the base from which the tumor had been removed. A low grade of inflammation was no doubt established by the operation, which involved the remaining thickness of the uterine wall, and in a few days an opening would have existed. Either some fluid did escape into the peritoneal cavity, or the softening process excited the local inflammation in the peritoneum. She was, however, rapidly dying from blood poisoning, so that it would have required but a slight shock, at any time, to have caused death.

Corroding Ulcer.—An ulcerative process attended with great destruction of tissue, which is supposed to originate on the cervix. It may extend within the cavity, but is usually confined to the walls of the vagina, through which it often penetrates into either the bladder or rectum. It may sometimes, in the same subject, open into both cavities, for such cases have been recorded, but I have never known of an instance. This form of malignant disease is almost as rarely met with as is true sarcoma. We know nothing of its early stage, since it is always far advanced before any suspicion arises of its existence. The disease seems to be confined to those who have been frequently pregnant, and arises about the time of the final cessation of menstruation.

Hemorrhage is one of the first symptoms, and its significance may for a time be overlooked by attributing its occurrence to a change of life. There is frequently no pain, and consequently medical advice may not be sought until the coming on of the thin and offensive vaginal discharge, which always accompanies cancerous ulceration in every form. As the disease advances, the effects are very similar to those of cancer in the cachectic condition: there is increase of pain, loss of flesh, and appetite, with dyspepsia and constipation, and death, at last, from exhaustion, or from the shock attending some sudden attack of peritonitis. Yet, among those suffering from corroding ulcer, there will be many more exceptions to every rule than there are among those with any other form of malignant disease of the uterus. I have seen two or three instances where no pain was experienced from the beginning to the end, and when the patients died from sudden attacks of inflammation, brought on by the spread of the disease, they seemed to be in perfect health. After they had learned to keep themselves clean, and to check any sudden bleeding, they were able to get as much enjoyment out of life as the average number of women in good health. I think, as a rule, women suffer less pain, and that the progress of the disease is much slower with corroding ulcer than with cancer proper.

CASE XXV.—I was consulted several years ago by a lady 71 years of age, who was then in good health for one at her time of life, and yet she had had this disease for probably twenty years. This I judged had been the case from the symptoms which were presented, while already nine years had elapsed since the labia had been destroyed by the advance of the disease from the vagina. In her case there had been no loss of blood for many years, so long in fact that she could give no approximation as to the time. I found on making a vaginal examination that everything seemed to have been destroyed but the bladder and urethra, and yet she understood so well how to take care of herself, that no one would have had the slightest suspicion of her condition. Her position in society was well known to me, and I have not the slightest doubt as to the accuracy of her statements. She lived for some eighteen months after I saw her, but I was never able to ascertain the immediate cause of her death.

Diagnosis and Treatment.—There would be but little difficulty, from the history of any case, to ascertain that malignant disease existed, but without an examination it would not be easy to determine the form. We will find the same offensive sero-pus-like discharge. With the finger the outline of the ulceration can be distinctly traced, precisely as in cancerous ulcerations; the surface breaks down, and is always below the level of the surrounding healthy tissue. On the introduction of the speculum, the ulceration will appear as a roughened surface of a dirty grayish-brown color, surrounded by a perfect line of demarcation. The ulcerated surfaces terminate by a narrow but marked red line directly in contact with perfectly healthy tissue. In this disease we never find cancer cells or infiltration in the neighboring tissues; the uterus is generally of a natural size and perfectly movable, unless in the last stages when it has been fixed by a recent attack of inflammation.

I have nothing to add to the general plan of treatment already given, there being the same necessity for the most perfect cleanliness, to keep up the general health, and, when necessary, to relieve the suffering of the patient by the judicious use of anodynes. If the disease be seen at a comparatively early stage, I would recommend the most thorough application of the cautery. There exists but little hope of eradicating it, but we are often able to delay its progress by this means.

Malignant Disease of the External Organs of Generation.—But little in addition need be stated in relation to cancer of the external organs of generation. It is sometimes limited to the clitoris, but, as a rule, the disease is in the form of the corroding ulcer extending from the vagina. This form of cancer has been termed rodent ulcer, and by some lupus from its resemblance to lupus in other parts of the body. But I regard all forms of malignant disease found at the outlet of the vagina as corroding ulcer or epithelioma, modified somewhat by the difference of tissue.

Any suspected growth on the labia should be extirpated without delay, while the parts are yet movable. The edges of the wound must be brought together and secured by silver sutures. This will check any amount of bleeding not excessive, and leave but a cicatricial line after the process of healing has terminated. But if bleeding should recur, it can be arrested promptly by placing a rolled compress, the size of the finger, on each side of the suture and securing these by a T bandage.

Cancer of the Rectum.—I do not intend to treat of cancer of the rectum, since it is not strictly within the scope of this work, but I wish to place on record the description and after history of an operation which is of interest in connection with this subject.

CASE XXVI.—Mrs. M. D., aged 35, was admitted to the Woman's Hospital April 1, 1871. She had borne seven children, and had one miscarriage; the last pregnancy was four years previous to admission. Her labors had all been difficult, and with her miscarriage she had a great loss of blood, and suffered from pain afterwards; was confined to her bed for seven weeks. After this miscarriage she never regained her health, but had a great deal of backache, pressure on the bowel, pain down the right leg, with prolapse of the anus for a year afterwards.

At the time of her admission the period was regular, but frequently lasted two weeks. Her chief complaint was a feeling of an uneasy sensation in the lower part of the back near the anus, which was accompanied by a frequent desire, sometimes as often as five or six times daily, to evacuate the bowels. This feeling had existed about two years prior to admission. But from the previous Christmas she had been subjected to pain of a sharp lancinating character, which was not continuous. Her suffering had become so great within a short time that she was unable to sleep or do anything without being all the time under the influence of opium. This had already affected her general health, for she had become pale, and had lost both flesh and strength, so that she spent the greater portion of her time in bed.

At length she consulted Dr. Sims, who discovered a hard circumscribed mass the size of a hen's egg, occupying the posterior wall of the rectum an inch above the sphincter, very painful to the touch. There was no discharge from this mass in the bowels at the time of the examination. Dr. Sims removed a portion, and as the microscope showed it to be epithelial cancer, he advised her to enter the Woman's Hospital, then in my charge.

I found the mass as described above, and I could distinctly trace it out to its limits, but below, just within the sphincter, and surrounding the gut, so as to include about an inch of the recto-vaginal septum, the tissues felt as if infiltrated with serum. The muscle itself was more rigid than usual, and the examination gave her a great deal of pain. The mass was evidently increasing in size, very sensitive when touched, and filled up the passage to such an extent as to seriously obstruct the canal. No enlargement of the glands could be detected, and I decided to remove the mass.

April 17. Operation. Present, Drs. Sims, Wm. H. Van Buren, James R. Wood, and others. After the patient had been etherized, the sphincter ani muscle was fully dilated by stretching, so as to enable me to get at the mass with greater facility. It was then drawn down by means of a double tenaculum, and held by an assistant. A steel grooved director, as the most convenient instrument for the purpose, was pushed through the skin in front of the coccyx and just behind the outer edge of the sphincter, into the cellular tissue of the pelvis, and then made to puncture the rectum, in healthy tissue, just beyond the upper edge of the tumor. The end was turned out of the gut and pushed far enough forward to rest on the perineum while the other end was over the coccyx. Then a second director was passed around from the outer side of the muscle on one side, through the cellular tissue into the rectum, across to the other side, through the cellular tissue and skin again to the opposite side of the muscle. So that the mass, with a portion of the rectum above, was now brought through the anus and fixed by the two directors, which had been passed behind the mass at right angles to each other, with their ends resting outside on the soft parts. The chain of an écraseur was placed behind these two instruments and slowly tightened until the whole mass, as transfixed, was cut through along the course of the directors. By this means I removed the entire sphincter muscle, about three inches of the posterior wall of the rectum, and about an inch and a half of the rectal surface of the recto-vaginal septum. The immediate result was a most formidable opening in the connective tissue of the pelvis, about three inches in diameter, and cone-shaped from below. There was not the slightest bleeding at first, but I detected a hard mass a little to one side, as if it were a lymphatic gland, which I snipped off with a pair of scissors. I at once realized my mistake, for I had opened a vessel of large size, and as it retracted deeper into the cellular tissue I could not secure it by a ligature. I placed over the surface a thick compress of cotton, which had been wet with alum but squeezed dry, and then introduced over this a vaginal glass plug fully two inches and half in diameter.

Finding that this arrested the bleeding, it was covered in front by a compress of a towel rolled up, and a T-bandage over all.

For several days following, there was very marked febrile reaction, with excruciating pain from the continued pressure of the glass plug, so that it was necessary to keep her all the time fully under the influence of opium. As the catheter could be introduced by slightly depressing the edge of the plug, this instrument was not disturbed until April 20, when suppuration having begun, the plug and cotton tampon could be removed with safety. This was followed by a profuse brown discharge without odor. The passage was then syringed out gently with a weak solution of carbolic acid and warm water, to the great relief of the patient. That afternoon the bowels were moved naturally, she was conscious of the passage but had no power of control. No further treatment was needed, except the administration of an injection several times a day.

April 23, the bowels were moved again, but with considerable pain. April 29, the bowels continued to act regularly, though when moved she suffered pain, and had a free brownish discharge afterwards. The use of opium had been steadily diminished from excessive doses to ♏ xx of Magendie's solution daily; she now began to sit up. May 15, the wound had almost entirely healed, the patient walking out, feeling well, with improving retentive power, but still some slight pain after every movement of the bowels. Discharged June 5, surfaces all healed, with good retentive power, and the parts free from induration. As the healing process advanced and the surfaces contracted, the healthy gut above was drawn down, and brought nearly in contact with the external parts. She promised to return in a few weeks, as I feared the entrance to the gut would close by contraction, when I determined to make an opening into the vagina.

She returned at the end of eighteen months to say that she was perfectly well. Six months later, she called for the same purpose, when I detected a movable mass, about half an inch in diameter, in the portion of the recto-vaginal septum which was not removed. I wished to operate at once, but it was three months before she could make up her mind, as she was feeling perfectly well. I then found it had reached to the sigmoid flexure; she was already beginning to be poisoned by the accumulation in the colon. I proposed colotomy for her relief, but she would have nothing more done, and died a few weeks afterwards.

CHAPTER XXVII.

DESCRIPTION, ETIOLOGY, AND DIAGNOSIS OF FIBROUS GROWTHS OF THE UTERUS.

Mode of formation—Etiology—Tables XL. to LII. inclusive—Diagnosis.

A FIBROUS growth has its origin within the muscular tissue of the uterus, and is generally of a dense structure, but not always, and it may or may not undergo cystic degeneration.

Such a tumor may remain as an isolated mass within the uterine tissue, being limited in growth, or it may gradually involve the greater portion of the organ, attaining an almost unlimited increase in bulk.

A fibrous tumor of the uterus has been termed a "fibro-myoma" by Virchow, a "fibroid" by Rokitansky, and "a partial hyperplasia of the uterine parenchyma" by Klebs.

While small, such a growth may be designated a fibroid; when larger, and out of the pelvis, it may be called a fibrous tumor, or a fibrous growth of the uterus, without reference to the degree of development.

As an exceptional circumstance, an accumulation of fluid sometimes occurs, within certain portions of these growths, and then they are said to have undergone cystic degeneration. But should this process become so extensive as to involve the whole mass, leaving but little of the fibrous element, it is then termed a fibro-cystic tumor.

According to Klebs,[1] "Microscopic investigations show that the chief mass of the tumor consists of smooth muscular fibres which considerably exceed in size those of the unimpregnated uterus." "The muscular fibres are arranged in bundles, and the latter unite variously at acute angles to form larger groups, which enclose a wide capillary bloodvessel. The walls of the latter consist of a simple layer of endothelium cells with large nuclei, and are supported by a thin layer of fibrous connective tissue, from which processes penetrate between individual groups of muscular bundles, and unite with coarse partition walls between the individual vascular districts. Between the muscular bundles, as well as between these and the connective tissue sheaths of the vessels, may be observed everywhere, by careful treatment, narrow slit-like gaps, which here and there contain white blood corpuscles, and are surrounded by a fine boundary line, within which, here and there, lie nuclei. A cavernous structure thus originates, which is not found in the normal uterine tissue, and it is very probable that these cavities are to be regarded as lymph spaces in which the bloodvessels and muscular bundles are suspended, as it were, by fine bands of connective tissue."

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[1] Handbuch der pathologischen Anatomie. Von Dr. E. Klebs, vierte Lieferung.

"The further increase in size of these tumors ensues rarely by the coalescence of several of them; more frequently it takes place by the same process being repeated which gave rise to the smallest and simplest fibro-myomata. Each individual vessel, with the muscular and connective tissue masses belonging to it, proliferates again and forms, as it were, a second generation of nodules, which are imbedded in the original tumor and distend the latter."

"Not rarely their disposition is such that the tumor is arranged in the form of wedge-shaped lobes around the centrally situated large vascular trunks, the broad bases of which lie on the surface. In other cases the formation of secondary nodules occurs only in particular places of the tumor, and these originate quite irregular tuberous forms. These peculiar inner processes of growth lead now to dislocations of the tumors, all of which had a common origin in the muscular tissue of the uterus. If increase in the parts adjacent to the mucous or serous membranes ensues, especially in nodules superficially situated, the latter elevate themselves above the surface and finally, sustained by the increasing weight, project entirely beyond the surface. In this way fibro-myomata originate, which either are suspended by a narrow pedicle quite beyond the uterine wall (extramural fibro-myomata), or the connection with the latter is more extensive through a looser layer of tissue pervaded by wide venous sinuses. In the latter case the dilated veins can frequently be traced through the entire thickness of the uterine wall. Further differences in the structure of these tumors are occasioned by the preponderating development of one of their histological constituents, and by degenerative processes. In regard to the first series, each tissue participating in the formation of the fibro-myoma can displace the rest. Most frequently this takes place on the part of the connective tissue, whereby the entire tumor becomes denser, firmer, more fibrous; the lymph spaces and bloodvessels within the tumor are narrowed and partly obliterated; the smooth muscular bundles are preserved, but the individual fibres can no longer be recognized separately; in their place, very narrow, long, rod-like nuclei lie embedded in a striated basis substance. Accordingly, even in this stage of development, the tumor cannot at all be pronounced a pure fibroma. Its biological activity is herewith closed, and these are just the forms in which degenerative processes appear. A preponderating development of the muscular tissue, which would stamp the tumors as pure myomata, is rare; in general, the formation of the muscular substance runs parallel with the vascular development, and the richer nutritive supply thereby originating; yet tumors also occur which from the outset consist almost entirely of smooth muscular fibres, possess the grayish-red, dimly transparent appearance of normal uterine muscular tissue, and are evidently contractile."

"In a like hyperplastic way can the vessels of the fibro-myomata develop; the lymph spaces dilate to smooth-walled cysts, destitute of a special membrane, and filled with clear limpid fluid. The process begins in the centre of the tumor, in the immediate neighborhood of the larger vessels, and the cysts frequently exhibit narrow processes, which are prolonged into the connective tissue partition walls between the individual nodules, or there are formed here swollen cysts placed in rows. Cystic fibro-myomata of the uterus can attain very considerable size, especially when, as may frequently happen, heterologous, especially myxomatous and sarcomatous, new formations become associated with them. But also simple cysts of considerable size are known, which are surrounded on all sides by muscular substance. Their contents then are usually dark brownish-red from altered blood, the walls villous, the cavity pervaded by muscular trabeculæ. In these cases a softening of the walls appears to have introduced the enlargement of the cystic lymph spaces."

"Bloodvessels of a venous character, in a state of ectasis, are very frequently found, as already mentioned above, in the vicinity of the myomata, and contribute, in the extra-mural forms, not a little to the loosening of the connection between the tumor and the uterine tissue. Here those bleedings characteristic of the sub-mucous forms most frequently originate; partial separation of the surface, thinned by the traction of the tumor, ensue, opening the vessels. In this latter case, dilatation of the bloodvessels takes place partly in a passive manner, while the development of ectases of the bloodvessels within the tissue of the tumor is of a decidedly active character, their formation being probably already laid in the origin of the tumor. Virchow discriminates this form properly as teleangiectatic or cavernous myoma

(myoma teleangiectases seu cavernosum). Their structure corresponds completely to that of the compound fibro-myomata, but the muscular substance preponderates, whilst the connective tissue portion diminishes. The large muscular cells arranged together in bundles, immediately touch the vascular walls, which consist of a single layer of very large and readily detached spindle-shaped endothelium cells. In those places in which this development has advanced furthest, the tissue is completely like the erectile tissue of the corpora cavernosa, only narrow partition walls separating the large blood sinuses from one another; likewise we see, on longitudinal section, smooth-walled dilated vessels which lead to the wide vascular sinuses in the periphery of the nodules of the tumors. The cavernous spaces within the nodules I might designate, on account of their structure, as ectatic capillaries. The smooth muscular fibres in these tumors possess a considerable degree of contractility; in the recently hardened preparations we see regular flexions of the bundles in the transverse direction, occasioned by the hardening process, just as occur in similarly treated smooth muscular tissue. In this way is explained the often very quickly changing fulness of the bloodvessels, and the increase in volume that has been many times observed in these tumors, reaching sometimes, according to Kiwisch, to double the size of the womb. From this must be discriminated the slower increase or diminution in size of the organ, which depends on the filling of the split-like lymph spaces, especially in the vicinity of the teleangiectatic myomata."

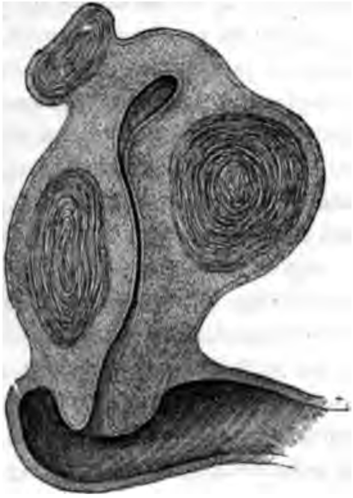
I have quoted at length from this author, since he presents the latest information on this subject, and I have nothing to offer of my own on the early development of these tumors.

Fibrous growths of the uterus are of themselves innoxious, but as a rule, they cause great mechanical disturbance from bulk and weight. Therefore, hemorrhage with menstrual derangement from obstructed circulation will be one of the earliest symptoms. With increased growth there occur certain displacements of the uterus, due chiefly to retroversion and prolapse. The healthy action of the bladder and rectum becomes impaired at an early stage, as a consequence of pressure, from which great suffering is caused by irritation of the bladder, constipation of the bowels, and the formation of hemorrhoids. Moreover, if the tumor remains wedged within the pelvis, the continued pressure on the nerves and bloodvessels connected with the lower extremities leads often to great suffering and serious consequences from the obstructed circulation. Should the tumor continue to grow and occupy the abdominal cavity, death must ultimately result from exhaustion. Anæmia is early caused by the continued loss of blood, while the state of exhaustion is at length completed by the functional disturbance due to continued pressure on the stomach, lungs, heart, and kidneys.

1st. A tumor or a series of tumors may, by increasing bulk, involve the whole uterus in every direction with the consequences just described.

2d. The growth may become developed towards the outer surface of the organ, or in the direction of the uterine canal. If on the outer surface, it would be termed a sub-peritoneal fibroid. As such it may remain partially protruding from the uterine wall, or it may become entirely expelled so that its connection with the uterus would only consist of the peritoneal covering and a little connective tissue. This would form a pedunculated sub-peritoneal fibroid, with but little vitality since its source of nutrition will have been nearly cut off. It may thus remain and gradually undergo some degeneration. The weight of such a tumor as shown in Fig. 93, near the fundus, may gradually cause the connection with the uterus to be stretched out into so thin a pedicle, that the mass may become at some time separated, as the result of violence. Peritonitis and its consequences would, of course, result from the presence of the detached tumor now causing irritation like a foreign body. The mass may become encysted in the pelvis, and eventually be destroyed in an abscess from cellulitis, or it may form new attachments and receive a sufficient supply of blood to enable it to continue to grow.

Fig. 93.



Interstitial and sub-peritoneal fibroids.

A sub-mucous fibroid may gradually be forced out from the uterine tissue into the canal, as has been shown to take place under the peritoneum. This is accomplished by contraction of the uterine tissue by which the tumor is driven in the direction offering the least resistance. As the growth advances into the canal, it will receive a covering of the mucous membrane over the projecting portion. When favorably situated the tumor becomes pedunculated, and is then termed a polypus.

It has been generally taught that each tumor is invested with a distinct capsule. This is a most important point, and from its bearing in practice should be definitely settled. While it is not my desire to make an issue with the pathologist, since I cannot substantiate my impressions from actual study of the minute tissues, my observation in many cases leads me to question the existence of such a covering. When a fibrous tumor is growing rapidly, it certainly cannot be then invested, or isolated, as it were, by a capsule. Such an arrangement could only be conceived of after a tumor had ceased to grow. As a fibrous tumor grows, it seems to incorporate the uterine tissue in advance of the actual limit of the tumor, without producing at first a marked change in structure, as a drop of water would do on a lump of sugar, permeating the mass before effecting the solution of each successive portion. Experience has taught me that a fibrous tumor, while still increasing in size, cannot be enucleated as from a capsule. It may be torn out by force from the uterine tissue, but it will be done at the expense of its integrity, since portions of the tumor will be left adherent to the uterus, and healthy uterine tissue will be found on the ragged surface of the tumor. When a fibroid has ceased to grow, and has been long subjected to compression by uterine contractions, it can be shelled out of its bed with the greatest facility, and with a smooth surface as from a capsule. But the tumor has not in reality acquired a distinct membranous investment, the enucleation being determined simply by a difference in the degree of density of tissue between the hard fibroid and the uterine structure. After macerating a hard fibroid I have succeeded in separating portions of four and five distinct investments, like the concentric layers of an onion, each layer being thinner and thinner from without inward, until the last and innermost becomes blended with the true fibrous structure. At the Woman's Hospital, I once accidentally enucleated a fibroid from its outer covering. This was afterwards separated from the uterine tissue with difficulty, and was supposed at the time to be the thick walls of a cyst.

3d. If the tumor remains interstitial it will receive a much smaller supply of blood than if it were situated just under the mucous membrane. It frequently then remains passive, and from being subjected to long and continued pressure by uterine contraction, it at length becomes exceedingly dense in structure, with the not uncommon result of finally undergoing calcareous degeneration. This structural change has been compared to a coral formation with minute interstices, as in the spongy portion of bone. It is a degeneration of the tissue proper, leaving the few bloodvessels unchanged in their course through the porous portion. These masses are sometimes expelled from the uterus, and are mentioned by the early writers who were, however, ignorant of their mode of formation. I have found this degeneration in the midst of a second growth, showing that the first had ceased and undergone this degeneration, but became afterwards involved and embedded in the advance of a second tumor which had an entirely different origin.

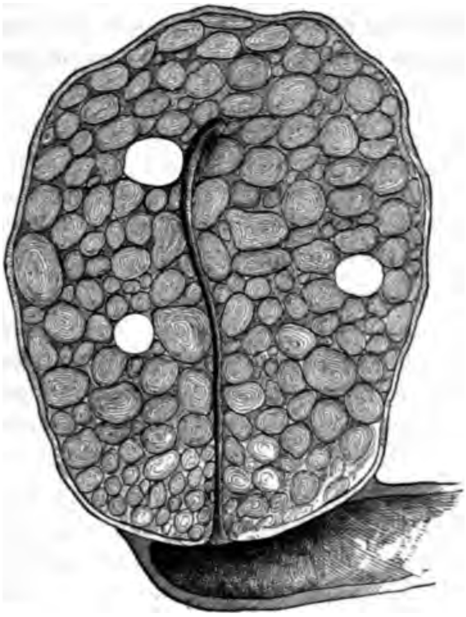
The uterus sometimes disintegrates, as it were, into many distinct tumors, as I have had occasion to observe. While in charge of the Woman's Hospital, some ten years ago, a woman was brought to the institution, suffering from an immense fibroid tumor, and in an exhausted condition. For several years she had been free from hemorrhages, and the tumor had apparently increased but little in size during the same time. But from the effects of long pressure and from the great weight of the mass she had suffered continually. For her permanent relief there was nothing to be done, since she was in too exhausted a condition to admit of an attempt at removal of the uterus, if this had been thought advisable. She was emaciated to a remarkable degree, so much so that the tumor really constituted the greater portion of her body. Every function had long been obstructed in its healthy action, and she died from exhaustion a few days after admission.

After opening the abdomen the tumor was found to be literally a conglomerate mass of nodules held together apparently by a thin capsule over all, through which the inequalities could be seen and felt, while through the abdominal wall the tumor seemed to be solid. The uterus was laid open with great difficulty and in section presented very much the appearance represented in Fig. 94. The whole uterine tissue had become converted into hundreds of fibroids of all sizes, with but little or no connective tissue between them. These growths had gone on until at length the bloodvessels in the interior had become obliterated by pressure, and only those masses forming the outer portion could have received any nutriment through the circulation. They had in fact become foreign bodies. Within the mass several tumors were found to have undergone calcareous degeneration, as represented in the figure. Subsequently a somewhat similar case, but of less size, died at the Woman's Hospital in the service of either Dr. Sims or Dr. Peaslee.

4th. Fibrous tumors sometimes undergo disintegration and absorption. As the effect of direct injury, or in connection with the puerperal state, the mass may after sloughing undergo purulent disin-

tion, and this process is almost always complicated by symptoms
od-poisoning. These tumors are also occasionally absorbed and

Fig. 94.



Multiple fibroids.

lly disappear after having reached a point of development at which
supply of blood seems to be cut off.

SE XXVII.—I had a woman several years under my observa-
who was a seamstress in my employ during the greater part of
ime. She had a well-defined fibroid on the anterior wall of the
s, as large as a hen's egg, which caused much irritation of the
ler, and she suffered in addition from constant hemorrhages. I
ed her for some six months without any benefit, in fact the growth
ased in size. Some eighteen months afterwards she informed me
she had gone several weeks without a show, and had just passed
gh a natural period. On making an examination I was surprised
d the tumor had greatly decreased in size, and in two months
that time, the uterus was of a normal size, with not the slightest
ge of the fibroid remaining. The tumor for some cause had pro-
y undergone fatty degeneration, and was absorbed.

have had three women under observation, each with a fibroid on
nterior wall, which disappeared during a subsequent pregnancy.
of these was a lady of wealth and position, residing in Brook-

[illegible] in consequence of the subsequent absorption of the fibroid. I [illegible] reputation among her family connections.

CASE XXVIII.—This lady had been married a number of years and had been sterile and irregular. I was called to see her in consequence of her suffering from great pressure on the rectum, which had been increasing, and at length had become complicated with retention of urine. I found the uterus completely retroverted, with the cervix behind the symphysis, and containing a fœtus at about the third month of development. Above the pubes was found a sub-peritoneal fibroid in the anterior wall of the uterus, just above the vaginal junction. This could be felt through the abdominal parietes, and was almost as prominent and well-defined as a door knob would be when in the grasp of the hand. After emptying the bladder, she was placed on her knees and elbows, and in her nightgown, that the abdominal walls might be perfectly relaxed. I was then able, by pressure from the rectum and by aid of the force of gravity, and the leverage exerted by means of this fibroid, to lift the uterus out of the pelvis, so that the cervix was made to occupy the position in which the fundus was before the operation. When this had been accomplished, the uterus was crowded back against the promontory of the sacrum, as the fibroid rested behind the pubes. The relief was perfect, but it was evidently a question of importance to determine without delay if she could go and be delivered at full term with safety. This I did not consider myself competent to decide, and called the late Dr. George T. Elliott into consultation. The doctor made several careful examinations, and ascertained accurately, by measurement, the pelvic diameters, with the conclusion that she should go to full term. I placed her in his charge, and at my request she left home and took a furnished house in his neighborhood, that she might have every advantage. Dr. Elliott saw her frequently during the course of her pregnancy, in relation to her general condition, but did not, I believe, make an examination after the fifth month. As often, and very provokingly, happens under such circumstances, Dr. Elliott was unexpectedly detained by some case seen in consultation out of town at the time when labor came on, and the husband in his anxiety for her condition called in the late Dr. Budd to attend her. The labor was a remarkably easy one, and Dr. Budd, knowing nothing of the history of the case, and finding no tumor, expressed his doubt if one had ever existed. Dr. Elliott and myself simply had the opportunity of verifying Dr. Budd's statement that she had no tumor at that time, but we were denounced for our ignorance, and for the anxiety we had caused.

The second case was a patient in the Woman's Hospital under the charge of Dr. R. C. M. Page, while he was house surgeon in that institution. I examined the woman frequently during her stay in the [illegible] She subsequently became pregnant, and after her delivery it was found that the tumor had disappeared. This fact I verified by an examination, and the woman has remained for several years under Dr. Page's observation without a return of the growth.

The other instance was in my private practice, and was seen only by myself. The tumor was much smaller than in either of the other cases, but the fact was as well settled in my mind as to its disappearance during her pregnancy.

Fibroids occasionally become the seat of sarcomatous and carcinomatous growths. I have had several instances under observation where the tissue of a single fibroid rapidly underwent the metamorphosis into sarcoma. Klebs makes the following statement in regard to these growths, and in direct connection with what has just been quoted from his work on the development of fibroids. "With these hyperplastic new formations, heteroplastic ones become associated, of which, within the fibro-myomata of the uterus, myxomatous and sarcomatous developments occur. Epithelial formations are completely wanting, and genuine carcinomata can thence only proceed out of fibro-myomata in those cases in which the formation of the tumor extends to the surface of the mucous membrane."

"The growing of the carcinoma into the myoma happens in the same way as the penetration would take place into the normal uterine muscular tissue, continuously or discontinuously. The development of myxomatous and sarcomatous tissue proceeds from the neighborhood of the vessels, and embraces usually only particular parts of the tumor, which in the one case undergo a gelatinous softening, and in another are transformed into a whitish-gray fibrous tissue. The latter especially proliferates extensively, and leads thereby to considerable enlargement of the tumor, mostly one-sided." We will have again to refer to this subject when treating of the forms of malignant disease.

It is not impossible that an aneurism may be developed in or upon a fibrous tumor of the uterus, by dilatation of one or more of its principal vessels. Its existence would be indicated by the aneurismal purr or thrill in the site of the tumor. The diagnosis must often be very obscure, and the treatment, where the tumor is so located as to render its removal or the application of a ligature impossible, necessarily involves ablation of the uterus and appendages. The cure by continued pressure is not to be hoped for. A very interesting case of supposed aneurism complicating a fibrous tumor occurred in the practice of Dr. E. D. Forée, of Louisville, Kentucky, where there was a difference of opinion as to the diagnosis. The late Dr. W. L. Atlee was consulted, and he recommended an operation on account of the supposed aneurism. An attempt was made by him to remove the tumor with the uterus, but the patient died before the completion of the operation. Unfortunately, the close of the operation was so hurried, in consequence of the condition of the patient, that the sac was ruptured if an aneurism existed. A dissection of the tumor afterwards failed to reveal whether there was a true aneurismal sac, or only a cyst to which the pulsation and purr had been imparted from neighboring vessels.

In the *N. Y. Medical Record*, Jan. 3, 1880, will be found a case reported by Dr. C. E. Wing, of Boston, and in connection with it a carefully prepared description of the post-mortem appearances by Dr. Albert N. Blodgett. A true aneurism existed on the surface of the tumor, with a large false one in the substance of the growth itself. It was also shown that at several points the tissues of the tumor had undergone sarcomatous degeneration. An important point, is brought out by Dr. Wing, in showing the danger of sometimes wounding, or of including the ureter within the ligature when the attempt is made to remove a large fibrous growth and the uterus just above the vaginal junction.

Etiology of Uterine Fibrous Growths.—The statistical history, and the data which the general study of menstruation presents, furnish no evidence that fibrous growths ever exist at puberty. Fibrous tumors rarely make their appearance before the age of twenty-five in the unmarried, at a later age in the sterile, and at a much more advanced one with fruitful women. It is impossible to determine with accuracy the age at which these growths are most likely to appear, since their development is, as a rule, slow at first, and they may exist for an indefinite period before their presence is recognized. The age can only be approximately inferred from the average one at which professional advice was first sought, and this would seldom be before the tumor had reached a sufficient size to cause hemorrhage or some other disturbance. We may also gain some information as to the rapidity of growth from the length of time elapsing after the birth of the last child, for a fibroid, it is well known, is a cause of sterility. In Table XL. is shown the age at which 225 women, who had fibrous growths, were first examined. The earliest age was at 18, an unmarried woman; the next, a sterile woman, at the age of 22; 1 at 23; 10 between the ages of 24 and 25; and 1 at the advanced age of 58.

The age of greatest liability to fibrous growths, for all women, is shown to be between 30 and 35 years. But if we limit the considera-

TABLE XL.—*Ages at which 225 Women with Fibrous Growths were first examined.*

	Age at first consultation..	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	Total.
Fibroids.	Unmarried........	....	2	2	4	6	4	....	2	....	20
	Sterile..........	....	3	9	11	7	3	3	1	....	37
	Fruitful..........	....	2	4	19	18	12	7	....	....	62
	Total	....	7	15	31	31	19	10	3	....	119
Fibrous tumors.	Unmarried........	1	2	2	7	4	3	5	1	....	25
	Sterile..........	....	1	3	7	2	11	....	2	....	26
	Fruitful..........	....	....	3	10	5	7	8	1	3	37
	Total	1	3	8	21	11	21	13	4	3	88
Fibro-cysts.	Unmarried........	....	....	....	....	1	1	....	....	....	2
	Sterile..........	....	1	....	1	....	....	....	....	....	2
	Fruitful..........	....	1	2	....	5	1	2	1	2	14
	Total	....	2	2	1	6	2	2	1	2	18
Summary.	Unmarried........	1	4	4	11	11	8	5	3	....	47
	Sterile..........	....	5	12	19	9	14	3	3	....	65
	Fruitful..........	....	3	9	29	28	20	17	2	5	113
	Total	1	12	25	50	48	42	25	8	5	225
	Percentage for each period	.44	5.33	11.11	26.17	21.33	18.62	11.11	3.55	2.22	

TABLE XLI.—*Average Ages at first consultation of those who had Fibroids and Fibrous Tumors.*

Fibroids.	Average age.	Fibrous tumors.	Average age.
Unmarried	37.55	Unmarried	35.75
Sterile	33.46	Sterile	37.51
Fruitful	35.64	Fruitful	40.28
On all women	35.26	On all women	38.04

ion to those only who had fibroids and fibrous tumors, we find 35.26 years as the average age for the first, and 38.04 years for the latter (see Table XLI.). It would be natural to expect a sterile woman to seek advice at an earlier age, for the relief of her sterile condition, and this would afford the opportunity for the earlier recognition of the growth. But it is also probable that an increase in the size of the abdomen from a fibrous tumor would at first be mistaken by the sterile as well as the fruitful women for pregnancy, and so the

the supposed aneurism.
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Etiology of Uteri
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Situation of the fibroid in the fruitful women who had gone to full term and had never miscarried.	In front of the uterus	....	....	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Behind	....	....	2	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	To right	....	....	....	1	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	To left	....	....	1	2	2	[illegible]	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Total	..	....	3	7	14	7	11	3	1	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Percentage	....	....	6.38	14.89	29.78	14.89	23.40	6.38	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]
Situation of the fibroid in those who had gone to full term and had also miscarried.	In front of the uterus	....	....	1	1	1	....	2	....	....	....	5	....	....	....	....	....	14.20	17.00
	Behind	....	1	2	4	5	2	2	1	....	....	....	17	....	....	....	....	13.88	19.23
	To right	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	11.00	21.00
	To left	....	....	....	....	1	1	....	....	....	....	....	....	....	2	....	....	14.50	17.00
	Total	....	1	3	6	8	3	4	1	....	....	....	....	....	....	25	....	14.00	18.50
	Percentage	....	4.00	12.00	24.00	32.00	12.00	16.00	4.00	....	....	20.00	68.00	4.00	8.00				
Situation of the fibroid in those who had never gone to full term but had miscarried.	In front of the uterus	....	....	....	....	1	....	....	2	....	....	3	....	....	....	....	....	16.00	19.33
	Behind	....	....	....	1	....	1	1	....	....	....	....	3	....	....	....	....	11.06	21.00
	To right	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....		
	To left	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	15.00	18.00
	Total	....	....	....	1	1	2	1	2	....	....	....	....	....	....	7	....	15.28	19.83
	Percentage	....	....	....	14.28	14.28	28.57	14.28	28.57	....	....	42.85	42.85	....	14.28				

TABLE XLIII.—*Fibrous Tumors among Unmarried, Sterile, and Fruitful.*

	Age at first menstruation........	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	Unknown.	Summary.	Percentage.	Average age at puberty.	Average age at marriage.
Fibrous tumors found in the	Unmarried	1	1	3	4	6	3	3	1	....	2	2	26	31.70	14.19	
	Sterile	1	1	3	4	2	3	2	4	....	....	1	21	25.60	14.09	23.47
	Fruitful	....	1	6	4	8	5	4	2	1	....	4	35	42.68	14.14	24.68
	Total	2	3	12	12	16	11	9	7	1	2	7	82	....	14.14	24.23
	Percentage	2.43	3.65	14.63	14.63	28.04	13.41	10.98	8.53	1.21	2.43					

TABLE XLII.—*Location of Fibroid Tumors, and Age at Puberty, etc.*

Summary.

Age at first menstruation ....

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of such fibrous tumors
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development of fibroids. The
is not only held in check b
seen that these growths
pregnancy.

forty years the unmarried wo
tumors as the sterile or the fr
subject, when treating of the ca
this is one of the tributes which
celibacy. It seems as if it we

purpose of nature that the uterus should undergo the changes dependent upon pregnancy and lactation, about once in three years throughout the child-bearing period, and that, if the uterus is not physiologically occupied in child-bearing, a fibroid will the more rapidly develop into a fibrous tumor as the woman advances in life. This will also be the case with the married woman who has taken means to prevent conception, as well as with her who has been sterile from some cause beyond her control, but to a less degree in the latter case. I think I have had occasion to note that the sterile woman who has earnestly wished for children does not have her liability to fibrous tumor increased by the fact of her sterility, an instance, probably, of the remarkable effect of mind upon the body. Finally the woman who may have been fruitful in early life, but remained sterile long afterwards, from some accidental cause, may have a tumor developed, but is less liable thereto from having once borne a child.

We have condensed in Table XLIV. the facts concerning fibroids and fibrous tumors which are contained in the two preceding tables, showing again that the liability of unmarried and sterile women to these growths is greater than their relative proportion of all women under observation, while it is less with women who have been impregnated.

TABLE XLIV.—*Condensed from* TABLES XLII *and* XLIII.

		Fibrous tumors.	Fibroids situated in				Summary.	Percentage.	Average age at puberty.	Average age at marriage.
			Front.	Behind.	On the right.	On the left.				
Fibrous and fibroid tumors in the	Unmarried	26	7	11	2	1	47	19.66	14.20	
	Sterile	21	20	28	3	6	78	32.63	14.15	23.15
	Fruitful	35	20	45	3	11	114	47.69	14.42	21.20
	Total	82	47	84	8	18	230	....	14.30	22.04
	Percentage	34.30	19.66	35.14	3.34	7.53				

We will find in Table XLII. the average age at puberty and at marriage for each condition, and the locality of the fibroid with respect to each is also given, but I cannot attempt to make any definite deductions therefrom.

The same information will be found, in Tables XLIII. and XLIV., for fibrous tumors, and for all fibrous growths. In Table XLIV. we find the average age at marriage for the sterile woman to have been 28.15 years; for the fruitful woman 21.20 years; while the average for both was 22.04 years. We have here a practical point bearing upon the beneficial effect of marriage in limiting the liability to fibrous tumors. For nineteen hundred women under observation, with different diseases, the average age at marriage was 22.31 years. The average for all women who had been impregnated was 20.76 years, while for the sterile women it was 22.39 years of age. It is thus shown that the average age at marriage for the sterile and fruitful who suffered from fibrous growths, was much later than the general average.

The location of fibroids in the uterine walls is determined by some unknown law, yet one evidently exists, for about one-half of them are found on the posterior wall. Next in frequency they are found in front; then on the left; and lastly on the right side. As a fibroid increases in size, and becomes a fibrous tumor, it will be, as a rule, accompanied by others, and at length they all become so much incorporated with the uterus as to render it impossible to fix upon any special locality for them.

In Table XLV. is given the number of women with fibroids and fibrous tumors, who, as to menstruation, were regular from the first, regular after a certain time, and who were never regular. Then the proportion of the unmarried, sterile, and fruitful women is given together in the summary, which includes both fibroids and fibrous growths. By this table we see confirmed in another form the views which have been already expressed as to the relative liability of the unmarried, sterile, and fruitful women to fibrous growths.

By comparing this table with Table III. (page 155), which shows the regularity for all women under observation, it becomes evident that those who suffered in after life from fibrous growths were in excellent health at the time of puberty, so far as this may be inferred from the condition of the menstrual flow. The proportion of those who were regular from the first is essentially the same as the general average. A larger number were regular afterwards, and the proportion of those never regular is smaller, than the general average.

A comparison must be made between Table XLVI. and the standard, Table V. (page 157), in reference to the existence or absence of pain with the first appearance of the menstrual flow at puberty.

The first point to be noted in this comparison is that those in whom growths were developed afterwards suffered but little pain in the beginning of the flow. But the proportion of these was greater than

TABLE XLV.—*Fibrous Growths with reference to Regularity of Menstruation.*

	Condition of menstruation at Puberty.	Unmarried.	Sterile.	Fruitful.	Total and per cent.
Fibroids.	Regular from the first . . .	17	33	50	100
	Percentage	80.95	62.26	75.75	71.14
	Regular afterwards	4	12	14	30
	Percentage	19.04	22.64	21.21	21.42
	Never regular	....	8	2	10
	Percentage	....	15.09	3.03	7.14
	Total	21	53	66	140
	Percentage	15.00	37.85	47.14	64.81
Fibrous tumors.	Regular from the first . . .	18	14	22	54
	Percentage	72.00	70.00	70.96	71.05
	Regular afterwards	4	5	8	17
	Percentage	16.00	25.00	25.80	22.36
	Never regular	3	1	1	5
	Percentage	12.00	5.00	3.22	6.67
	Total	25	20	31	76
	Percentage	32.89	26.31	40.78	35.18
Summary.	Regular from the first . . .	35	47	72	154
	Percentage	76.08	64.38	74.24	71.29
	Regular afterwards	8	17	22	47
	Percentage	17.37	23.28	22.67	21.75
	Never regular	3	9	3	15
	Percentage	6.52	12.32	3.09	6.01
	Total	46	73	97	216
	Percentage	21.30	33.79	44.90	

of those who suffered from pain during the flow, while about the same percentage as is shown by the common standard were free from pain. If, however, we take each condition separately, the difference will be somewhat more marked. A larger proportion of the unmarried seem to have had pain in the beginning of the flow than is shown in Table V.; the other differences from the standard are unimportant. On the other hand, a smaller number of sterile women had pain at the beginning of the flow. The proportion is about the same for those who suffered pain during the flow, while a larger number were free from pain; thus showing that women who were afterwards made sterile by fibrous growths were in better condition at the time of puberty than other sterile women, in whom fibrous growths did not develop. In general terms the same may be said of fruitful women, although a somewhat smaller proportion of them were free from pain at the time of puberty than was the case with all the fruitful women under observation. The proportion of fruitful women who suffered during the flow was also less than that for the sterile. The same general law also holds good in regard to those who suffered from pain during the flow, since the proportion of sterile women so suffering is always the greatest. It is true the number of fruitful women given in Table XLVI. is very small, and would be of little significance if the facts brought out did not confirm those given for the larger number of women under observation.

TABLE XLVI.—*Fibrous Growths with reference to Pain During Menstruation.*

	Unmarried.	Sterile.	Fruitful.	Total.
With pain in the beginning of the flow	5	5	6	1[illegible]6
Percentage	31.25	31.25	37.50	7[illegible].40
With pain during the flow	13	23	7	[illegible]43
Percentage	30.23	53.48	16.27	19[illegible].50
Free from pain	28	45	84	15[illegible]7
Percentage	17.77	28.66	53.50	72[illegible].68
Total	46	73	97	21 6

In Table XLVII. is shown the relation between regularity or irregularity of the menstrual flow from the time of puberty, with the presence or absence of pain at that time, among women who, in after life, suffered from fibrous growth of the uterus. Thus, 16 women had pain at the beginning of the flow, of which 68.37 per cent. were regular from the first, 12.50 per cent. after a certain time, and 1[illegible].75 per cent. were never regular. Of these 11, or 7.14 per cent., of those who were regular, 2, or 4.27 per cent., of those who were regular afterwards, and 3, or 20.00 per cent., of those never regular, suffered from pain at the beginning of the flow. It is here shown that 72.33 per cent. of all women who developed fibrous growths began their menstrual life regular and free from pain. The absence of pain was evidently the rule, but the greatest percentage of those who suffered from pain did so during the flow, and were never regular. The number here is also too small to be of any significance were it not in accordance with the general rule.

TABLE XLVII.—*Showing the connection between the Regularity of Menstruation and Degree of Pain.*

		Regular from the first.		Regular afterwards.		Never regular.		Total number and percentage
		No. of cases.	Per cent.	No. of cases.	Per cent.	No. of cases.	Per cent.	
With pain in the beginning of the flow.	No. of cases	11	68.37	2	12.50	3	18.75	16
	Percentage	7.14	....	4.27	....	20.00	....	7.40
With pain during the flow.	No. of cases	28	64.97	10	23.25	5	11.62	43
	Percentage	18.18	....	21.27	....	33.33	....	19.90
Free from pain.	No. of cases	115	73.25	35	22.29	7	4.45	157
	Percentage	72.33	....	74.46	....	46.66	....	72.68
Total number and percentage		154	71.29	47	21.75	15	6.94	216

There is a tendency to hemorrhage during the development of a fibrous growth, for a greater portion of these tumors have their starting point in close proximity to the inner surface of the uterine canal. The first symptom with many cases is a loss of blood from within the uterus, and afterwards the recurrence of hemorrhage upon the slightest provocation is the rule. There are many exceptions where, although hemorrhage was the rule in early life, the quantity became less as the development progressed. This is due to a growth of the tumor in a direction where the circulation is but little obstructed, or to the gradual obliteration by the tumor as it grows of the vessels in its neighborhood. Finally, in a certain proportion of cases, change of life takes place, and the tumor decreases in size, and gives no further trouble, or it remains inert, simply being inconvenient from its bulk. Table XLVIII. shows the average duration of the first menstrual flow of all women who suffered in after life from one or more fibrous growths. It will be observed that the averages except for the unmarried are somewhat above those given in Table XI., page 167,

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

It is usual to judge of the [illegible] of menstruation by the duration of the flow, but this method cannot be [illegible] in studying the history of fibrous growths, since it may mislead us. I have known the length of the flow to become shortened under the influence of a fibroid, but more blood may be lost than would be the case with a fibrous tumor, although with the latter the duration of the flow may have been prolonged beyond the average.

We will at first present these changes more particularly in connection with the duration than the quantity. Afterwards we will consider the changes in the quantity, and these after all are to be regarded as of the greater importance practically.

Table XLIX. shows the duration of the flow in after life for all who had fibrous growths, and with this is given the condition as to regularity, and the pain suffered by these women at the time of puberty. The form of this table is the same as Table XLVII., with the substitution of the average length of the flow for the percentage on the number of cases, and the two should be studied together. Two facts are made prominent by this table, viz., that the longest duration of flow in after life was among those who previously had suffered pain during the flow, and that women who were never regular in after life menstruated longer at each period than the average.

If we turn to Table L. we can study these changes in the unmarried, sterile, and fruitful.

This table has been constructed on the same general plan as Table XII. (page 170), which may be taken as the standard in the study of menstruation.

The fibroids and fibrous tumors have each been divided into two classes, the first made up of those with whom the length of flow remained as at puberty, although, with a certain number, the quantity may have been changed more or less. The second division contains all in whom both time and quantity were changed in after life. Each division is subdivided into two sections.

TABLE XLIX.—*Showing the Length of Flow in after-life in connection with Regularity and Pain.*

		Regular from the first.		Regular afterwards.		Never regular.		Total.	
		No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.
With pain in the beginning of the flow.	Number of cases........	11	....	2	....	3	....	16	....
	Length of flow..........	....	4.90	....	5.00	....	5.66	....	5.06
With pain during the flow.	Number of cases........	28	....	10	....	5	....	43	....
	Length of flow..........	....	6 37	....	5.00	....	6.00	....	6.02
Free from pain.	Number of cases........	115	....	35	....	7	....	157	....
	Length of flow..........	....	5.68	....	5.40	....	5.85	....	5.63
Total number and average length of flow.	Number of cases........	154	....	47	....	15	....	216	....
	Length of flow..........	....	4.75	....	5.29	....	5.86	....	5.66

The first section of the first subdivision contains those with whom the flow remained in after life the same as at puberty, whether normal, too free, or scanty.

The second section of the same division, contains those in whom the length of the flow remained unchanged, but in whom the quantity became increased, lessened, or irregular, owing to the presence of the fibrous growth.

We have then given the number of cases, the average duration, and the percentages, on all these cases forming this special division in which the flow remained normal or too free, or became scanty, increased, lessened, or irregular; then the total number for the unmarried, sterile, and fruitful women, with the percentage on the total number for each condition of menstruation.

TABLE L.—*Condition of Menstruation in After-life* a

		Period remained unchanged as to time and quantity, being from the beginning						Length of period remained unchanged, but the quantity became afterwards either						Tota
		Normal.		Too free.		Scanty.		Increased.		Lessened.		Irregular.		Where m struation the begin was unchan in dura	
	Fibroid Tumors.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases.	Av. length of period.
Unmarried.	Normal	6	29	..	..	..	..	..	..	..	..	..	..	6	4.8
	Too free	..	..	4	30	..	..	..	..	..	..	..	..	4	7.5
	Scanty	..	..	..	..	2	12	..	..	..	..	..	..	2	6.0
	Increased	..	..	..	..	..	..	10	58	..	..	..	..	10	5.8
	Lessened	..	..	..	..	..	..	..	..	1	3	..	..	1	3.0
	Irregular	..	..	..	..	..	..	..	..	..	..	3	4	3	4.0
	Total	..	..	..	..	..	..	..	..	..	..	..	..	26	5.6
	Percentage	13.33	..	8.89	..	4.44	..	22.22	..	2.22	..	6.67	..	..	..
Sterile.	Normal	8	38	..	..	..	..	..	..	..	..	..	..	8	4.3
	Too free		..	6	44	..	..	..	..	..	..	..	..	6	7.3
	Scanty		..	..	..	2	8	..	..	..	..	..	..	2	4.0
	Increased	..	..	..	..	..	..	18	98	..	..	..	..	18	5.4
	Lessened	..	..	..	..	..	..	..	..	5	26	..	..	5	5.2
	Irregular		..	..	..	..	..	..	..	..	..	2	10	2	5.0
	Total	..	..	..	..	..	..	..	..	..	..	..	..	41	5.41
	Percentage	13.11	..	9.84	..	3.28	..	29.51	..	8.2	..	3.28	..	..	..
Fruitful.	Normal	4	14	..	..	..	..	..	..	..	..	..	..	4	3.50
	Too free	..	..	3	14	..	..	..	..	..	..	..	..	3	4.66
	Scanty	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Increased	..	..	..	..	..	..	4	23	..	..	..	..	4	5.75
	Lessened	..	..	..	..	..	..	..	..	4	16	..	..	4	4.00
	Irregular	..	..	..	..	..	..	..	..	..	..	2	9	2	2.2
	Total	..	..	..	..	..	..	..	..	..	..	..	..	17	4.47
	Percentage	11.76	..	8.8	..	..	..	11.76	..	11.76	..	5.88	..	..	..
Total No. of fibroids		18	..	13	..	4	..	32	..	10	..	7	..	84	..
Average length of flow		..	4.38	..	6.77	..	3.00	..	5.59	..	4.50	..	4.71	..	5.25
Percentage		12.86	..	9.29	..	2.86	..	22.86	..	7.14	..	5.00	..	..	..
	Fibrous Tumors.														
Unmarried.	Normal	3	12	..	..	..	..	..	..	..	..	..	..	3	4.00
	Too free	..	..	1	6	..	..	..	..	..	..	..	..	1	6.00
	Scanty	..	..	..	..	1	4	..	..	..	..	..	..	1	4.00
	Increased	..	..	..	..	..	..	9	53	..	..	..	..	9	5.8
	Lessened	..	..	..	..	..	..	..	..	1	6	..	..	1	6.00
	Irregular	..	..	..	..	..	..	..	..	..	..	4	20	4	5.0
	Total	..	..	..	..	..	..	..	..	..	..	..	..	19	5.5
	Percentage	12.00	..	4.00	..	4.00	..	36.00	..	4.00	..	16.00	..	..	..
Sterile.	Normal	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Too free	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Scanty	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Increased	..	..	..	..	..	..	7	43	..	..	..	..	7	6.1
	Lessened	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Irregular	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	..	..	..	..	..	..	..	..	..	..	..	7	6.1
	Percentage	..	..	..	..	..	..	35.00	..	..	..	..	..	..	..
Fruitful.	Normal	2	9	..	..	..	..	..	..	..	..	..	..	2	4.5
	Too free	..	..	2	16	..	..	..	..	..	..	..	..	2	8.00
	Scanty	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Increased	..	..	..	..	..	..	15	83	..	..	..	..	15	5.5
	Lessened	..	..	..	..	..	..	..	..	1	3	..	..	1	3.00
	Irregular	..	..	..	..	..	..	..	..	..	..	4	15	4	4.2
	Total	..	..	..	..	..	..	..	..	..	..	..	..	24	5.6
	Percentage	6.45	..	6.45	..	..	..	48.39	..	3.23	..	12.90	..	..	..
o. of fibrous tumors		5	..	3	..	1	..	31	..	2	..	8	..	50	..
length of flow		..	4.20	..	7.33	..	4.00	..	5.83	..	4.50	..	4.72	..	5.3
entage		6.58	..	3.95	..	1.31	..	40.79	..	2.63	..	10.53	..	..	..
ths		23	..	16	..	5	..	63	..	12	..	15	..	134	..
..		..	4.31	..	6.87	..	4.80	..	5.71	..	4.50	..	4.7	..	5.3
..		10.65	..	7.41	..	2.31	..	29.17	..	5.56	..	6.94	..	..	..

tion and Quantity, with Fibroids and Fibrous Tumors.

gth of Period became creased, with the Quantity either					Length of Period became Lessened, with the Quantity either						Total. Where menstruation became changed in time and quantity.			Summary.		
sed.	Lessened.		Irregular.		Lessened.		Increased.		Irregular.							
No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases.	Av. length of period.	Per cent. for each condition.	No. of cases.	Av. length of period.	Per cent. for each condition.
..	..	..	..	..	..	..	..	..	..	..	....	....	....	6	4.83	13.33
..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	7.50	8.89
..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	6.00	4.44
59	..	..	..	..	..	..	1	3	..	..	10	6.20	52.63	20	6.00	44.44
..	..	..	..	..	7	19	..	..	..	..	7	2.71	36.84	8	2.75	17.78
..	..	..	2	13	..	..	..	..	..	..	2	6.50	10.53	5	5.40	11.11
..	..	..	..	..	..	..	..	..	..	..	19	4.94	....	45	5.33	
..	..	..	4.44	..	15.56	..	2.22	..	..	..	....	....	33.92			
..	..	..	..	..	..	..	..	..	..	..	....	....	....	8	4.50	13.11
..	..	..	..	..	..	..	..	..	..	..	....	....	....	6	7.33	9.84
..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	4.00	3.28
79	..	..	..	..	..	..	1	2	..	..	10	8.10	50.00	28	6.30	45.90
..	..	..	..	..	7	22	..	..	..	..	7	3.14	35.00	12	4.00	19.67
..	..	..	3	14	..	..	..	..	..	..	3	4.66	15.00	5	4.80	8.20
..	..	..	..	..	..	..	..	..	..	..	20	5.85	....	61	5.55	
..	..	..	4.92	..	11.47	..	1.64	..	..	..	....	....	35.71			
..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	3.50	11.76
..	..	..	..	..	..	..	..	..	..	..	....	....	....	3	4.66	8.82
..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
70	..	..	..	..	..	..	1	3	..	..	9	8.11	52.94	13	7.38	38.24
..	1	5	..	..	3	12	..	..	..	..	4	4.25	23.53	8	4.12	23.53
..	..	..	4	27	..	..	..	..	..	..	4	6.75	23.53	6	6.00	17.65
..	..	..	..	..	..	..	..	..	..	..	17	6.88	....	34	5.67	
..	2.04	..	11.76	..	8.82	..	2.94	..	..	..	....	....	30.35			
..	1	..	9	..	17	..	3	..	..	..	56	....	....	140		
8.00	..	5.00	..	6.00	..	3.11	..	2.66	..	..	....	5.85	....	....	5.51	
..	.71	..	6.43	..	12.14	..	2.14	..	..	..	....	....	40.00	....	....	64.81
..	..	..	..	..	..	..	..	..	..	..	....	....	....	3	4.00	12.00
..	..	..	..	..	..	..	..	..	..	..	....	....	....	1	6.00	4.00
..	..	..	..	..	..	..	..	..	..	..	....	....	....	1	4.00	4.00
38	..	..	..	..	..	..	..	..	..	..	6	6.33	100.	15	6.06	60.00
..	..	..	..	..	..	..	..	..	..	..	....	....	....	1	6.00	4.00
..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	5.00	16.00
..	..	..	..	..	..	..	..	..	..	..	6	6.33	....	25	5.56	
..	..	..	..	..	..	..	..	..	..	..	....	....	23.07			
..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
51	..	..	..	..	..	..	..	..	..	..	6	8.50	46.15	13	7.38	65.00
..	..	..	..	..	4	13	..	..	..	..	4	4.00	30.77	4	4.00	20.00
..	..	..	3	18	..	..	..	..	..	..	3	6.00	23.08	3	6.00	15.00
..	..	..	..	..	..	..	..	..	..	..	13	6.53	....	20	6.50	
..	..	..	15.00	..	20.00	..	..	..	..	..	....	....	50.00			
..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	4.50	6.45
.	..	..	..	..	..	..	..	..	..	..	....	....	....	2	8.00	6.45
..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
43	..	..	..	..	..	..	..	..	..	..	5	8.60	71.43	20	6.70	64.52
..	..	..	..	..	1	4	..	..	..	..	1	4.00	14.29	2	3.50	6.45
..	..	..	1	7	..	..	..	..	..	..	1	7.00	14.28	5	5.00	16.13
..	..	..	..	..	..	..	..	..	..	..	7	7.71	....	31	5.90	
..	..	..	3.23	..	3.22	..	..	..	..	..	....	....	26.92			
..	..	..	4	..	5	..	..	..	..	..	26	....	....	70		
7.76	..	..	..	..	..	4.00	..	..	..	..	....	6.80	....	....	5.94	
..	..	..	..	..	6.58	..	..	..	..	..	....	....	34.01	....	....	35.18
..	1	..	13	..	22	..	3	..	..	..	82	....	....	216		
7.90	..	5.00	..	6.07	..	3.31	..	2.66	..	..	....	5.15	....	....	5.66	
..	.46	..	6.02	..	10.18	..	1.39	..	..	..	....	....	37.03	....		

which was taken from all the women under observation. This is a slight indication, and only a slight one, that a more vascular condition than is usual exists in certain women at the time of puberty, and hence they are more liable to the development of these growths in after life.

TABLE XLVIII.—*Length of the Menstrual Flow at Puberty, with Fibroids and Fibrous Tumors.*

Fibroids.	Average length of flow at puberty.	Fibrous tumors.	Average length of flow at puberty.
Unmarried	4.66	Unmarried	4.27
Sterile	5.29	Sterile	5.00
Fruitful	5.11	Fruitful	5.27
Average for all women	5.04	Average for all women	5.02

It is usual to judge of the condition of menstruation by the duration of the flow, but this method cannot be exclusively followed in studying the history of fibrous growths, since it may mislead us. I have known the length of the flow to become shortened under the influence of a fibroid; but more blood may be lost than would be the case with a fibrous tumor, although with the latter the duration of the flow may have been prolonged beyond the average.

We will at first present these changes more particularly in connection with the duration than the quantity. Afterwards we will consider the changes in the quantity, and these after all are to be regarded as of the greater importance practically.

Table XLIX. shows the duration of the flow in after life for all who had fibrous growths, and with this is given the condition as to regularity, and the pain suffered by these women at the time of puberty. The form of this table is the same as Table XLVII., with the substitution of the average length of the flow for the percentage on the number of cases, and the two should be studied together. Two facts are made prominent by this table, viz., that the longest duration of flow in after life was among those who previously had suffered pain during the flow, and that women who were never regular in after life menstruated longer at each period than the average.

If we turn to Table L. we can study these changes in the unmarried, sterile, and fruitful.

This table has been constructed on the same general plan as Table XII. (page 170), which may be taken as the standard in the study of menstruation.

The fibroids and fibrous tumors have each been divided into two classes, the first made up of those with whom the length of flow remained as at puberty, although, with a certain number, the quantity may have been changed more or less. The second division contains all in whom both time and quantity were changed in after life. Each division is subdivided into two sections.

TABLE XLIX.—*Showing the Length of Flow in after-life in connection with Regularity and Pain.*

		Regular from the first.		Regular afterwards.		Never regular.		Total.	
		No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.	No. of cases.	Length of flow.
With pain in the beginning of the flow.	Number of cases........	11	....	2	....	3	....	16	....
	Length of flow..........	....	4.90	....	5.00	....	5.66	....	5.06
With pain during the flow.	Number of cases........	28	....	10	....	5	....	43	....
	Length of flow..........	....	6 37	....	5.00	....	6.00	....	6.02
Free from pain.	Number of cases........	115	....	35	....	7	....	157	....
	Length of flow..........	....	5.68	....	5.40	....	5.85	....	5.63
Total number and average length of flow.	Number of cases........	154	....	47	....	15	....	216	....
	Length of flow..........	....	4.75	....	5.23	....	5.86	....	5.66

The first section of the first subdivision contains those with whom the flow remained in after life the same as at puberty, whether normal, too free, or scanty.

The second section of the same division, contains those in whom the length of the flow remained unchanged, but in whom the quantity became increased, lessened, or irregular, owing to the presence of the fibrous growth.

We have then given the number of cases, the average duration, and the percentages, on all these cases forming this special division in which the flow remained normal or too free, or became scanty, increased, lessened, or irregular; then the total number for the unmarried, sterile, and fruitful women, with the percentage on the total number for each condition of menstruation.

TABLE L.—*Condition of Menstruation in After-life as to*

	FIBROID TUMORS.	PERIOD REMAINED UNCHANGED AS TO TIME AND QUANTITY, BEING FROM THE BEGINNING						LENGTH OF PERIOD REMAINED UNCHANGED, BUT THE QUANTITY BECAME AFTERWARDS EITHER						TOTAL. — Where menstruation from the beginning was unchanged in duration.		
		Normal.		Too free.		Scanty.		Increased.		Lessened.		Irregular.				
		No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases.	Av. length of period.	Per cent. for each condit'n.
Unmarried.	Normal	6	29	..	..	..	..	..	..	..	..	..	..	6	4.83	23.08
	Too free	..	..	4	30	..	..	..	..	..	..	..	..	4	7.50	15.38
	Scanty	..	..	..	..	2	12	..	..	..	..	..	..	2	6.00	7.69
	Increased	..	..	..	..	..	..	10	58	..	..	..	..	10	5.80	38.46
	Lessened	..	..	..	..	..	..	..	..	1	3	..	..	1	3.00	3.85
	Irregular	..	..	..	..	..	..	..	..	..	..	3	4	3	4.66	11.54
	Total	..	..	..	..	..	..	..	..	..	..	..	..	26	5.61	..
	Percentage	13.33	..	8.89	..	4.44	..	22.22	..	2.22	..	6.67	..	..	..	30.95
Sterile.	Normal	8	36	..	..	..	..	..	..	..	..	..	..	8	4.50	19.51
	Too free	..	..	6	44	..	..	..	..	..	..	..	..	6	7.33	14.63
	Scanty	..	..	..	..	2	8	..	..	..	..	..	..	2	4.00	4.88
	Increased	..	..	..	..	..	..	18	98	..	..	..	..	18	5.44	43.90
	Lessened	..	..	..	..	..	..	..	..	5	26	..	..	5	5.20	12.20
	Irregular	..	..	..	..	..	..	..	..	..	..	2	10	2	5.00	4.88
	Total	..	..	..	..	..	..	..	..	..	..	..	..	41	5.41	..
	Percentage	13.11	..	9.84	..	3.28	..	29.51	..	8.20	..	3.28	..	..	..	48.80
Fruitful.	Normal	4	14	..	..	..	..	..	..	..	..	..	..	4	3.50	23.53
	Too free	..	..	3	14	..	..	..	..	..	..	..	..	3	4.66	17.65
	Scanty	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Increased	..	..	..	..	..	..	4	23	..	..	..	..	4	5.75	23.53
	Lessened	..	..	..	..	..	..	..	..	4	16	..	..	4	4.00	23.53
	Irregular	..	..	..	..	..	..	..	..	..	..	2	9	2	2.25	11.76
	Total	..	..	..	..	..	..	..	..	..	..	..	..	17	4.47	..
	Percentage	11.76	..	8.82	..	..	..	11.76	..	11.76	..	5.88	..	..	..	20.23
Total No. of fibroids		18	..	13	..	4	..	32	..	10	..	7	..	84	..	..
Average length of flow		..	4.38	..	6.77	..	5.00	..	5.59	..	4.50	..	4.71	..	5.23	..
Percentage		12.86	..	9.29	..	2.86	..	22.86	..	7.14	..	5.00	..	..	..	60.00
	FIBROUS TUMORS.															
Unmarried.	Normal	3	12	..	..	..	..	..	..	..	..	..	..	3	4.00	15.79
	Too free	..	..	1	6	..	..	..	..	..	..	..	..	1	6.00	5.26
	Scanty	..	..	..	..	1	4	..	..	..	..	..	..	1	4.00	5.26
	Increased	..	..	..	..	..	..	9	53	..	..	..	..	9	5.88	47.37
	Lessened	..	..	..	..	..	..	..	..	1	6	..	..	1	6.00	5.26
	Irregular	..	..	..	..	..	..	..	..	..	..	4	20	4	5.00	21.05
	Total	..	..	..	..	..	..	..	..	..	..	..	..	19	5.31	..
	Percentage	12.00	..	4.00	..	4.00	..	36.00	..	4.00	..	16.00	..	..	..	38.00
Sterile.	Normal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Too free	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Scanty	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Increased	..	..	..	..	..	..	7	45	..	..	..	..	7	6.42	100.
	Lessened	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Irregular	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	..	..	..	..	..	..	..	..	..	..	..	..	7	6.42	..
	Percentage	..	..	..	..	..	..	35.00	..	..	..	..	..	..	..	14.00
Fruitful.	Normal	2	9	..	..	..	..	..	..	..	..	..	..	2	4.50	8.33
	Too free	..	..	2	16	..	..	..	..	..	..	..	..	2	8.00	8.33
	Scanty	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Increased	..	..	..	..	..	..	15	83	..	..	..	..	15	5.53	62.50
	Lessened	..	..	..	..	..	..	..	..	1	3	..	..	1	3.00	4.17
	Irregular	..	..	..	..	..	..	..	..	..	..	4	18	4	4.50	16.67
	Total	..	..	..	..	..	..	..	..	..	..	..	..	24	5.87	..
	Percentage	6.45	..	6.45	..	..	..	48.29	..	3.23	..	12.90	..	..	..	48.00
Total No. of fibrous tumors		5	..	3	..	1	..	31	..	2	..	8	..	50	..	..
Average length of flow		..	4.20	..	7.33	..	4.00	..	5.83	..	4.50	..	4.75	..	5.50	..
Percentage		6.58	..	3.95	..	1.31	..	40.79	..	2.63	..	10.53	..	..	..	65.78
Total No. of fibrous growths		23	..	16	..	5	..	63	..	12	..	15	..	134	..	..
Average length of flow		..	4.34	..	6.87	..	4.80	..	5.71	..	4.50	..	4.73	..	5.36	..
Percentage		10.65	..	7.41	..	2.31	..	[illegible]	..	5.56	..	6.94	..	..	..	[illegible]

tion and Quantity, with Fibroids and Fibrous Tumors.

GTH OF PERIOD BECAME CREASED, WITH THE QUANTITY EITHER					LENGTH OF PERIOD BECAME LESSENED, WITH THE QUANTITY EITHER						TOTAL. Where menstruation became changed in time and quantity.			Summary.		
sed.	Lessened.		Irregular.		Lessened.		Increased.		Irregular.							
No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases and per cent.	No. of menstrual days.	No. of cases.	Av. length of period.	Per cent. for each condition.	No. of cases.	Av. length of period.	Per cent. for each condition.
..	..	..	..	..	..	..	..	..	..	..	....	....	....	6	4.83	13.33
..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	7.50	8.89
..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	6.00	4.44
59	..	..	..	..	..	..	1	3	..	..	10	6.20	52.63	20	6.00	44.44
..	..	..	..	..	7	19	..	..	..	..	7	2.71	36.84	8	2.73	17.78
..	..	..	2	13	..	..	..	..	..	..	2	6.50	10.53	5	5.40	11.11
..	..	..	..	..	..	..	..	..	..	..	19	4.94	....	45	5.33	
..	..	..	4.44	..	15.56	..	2.22	..	..	..	....	....	33.92			
..	..	..	..	..	..	..	..	..	..	..	....	....	....	8	4.50	13.11
..	..	..	..	..	..	..	..	..	..	..	....	....	....	6	7.33	9.84
..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	4.00	3.28
79	..	..	..	..	..	..	1	2	..	..	10	8.10	50.00	28	6.39	45.90
..	..	..	..	..	7	22	..	..	..	..	7	3.14	35.00	12	4.00	19.67
..	..	..	3	14	..	..	..	..	..	..	3	4.66	15.00	5	4.80	8.20
..	..	..	..	..	..	..	..	..	..	..	20	5.85	....	61	5.55	
..	..	..	4.92	..	11.47	..	1.64	..	..	..	....	....	35.71			
..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	3.50	11.76
..	..	..	..	..	..	..	..	..	..	..	....	....	....	3	4.66	8.82
..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
70	..	..	..	..	..	..	1	3	..	..	9	8.11	52.94	13	7.38	38.24
..	1	5	..	..	3	12	..	..	..	..	4	4.25	23.53	8	4.12	23.53
..	..	..	4	27	..	..	..	..	..	..	4	6.75	23.53	6	6.00	17.65
..	..	..	..	..	..	..	..	..	..	..	17	6.88	....	34	5.67	
..	2.04	..	11.76	..	8.82	..	2.94	..	..	..	....	....	30.35			
..	1	..	9	..	17	..	3	..	..	..	56	....	....	140		
8.00	..	5.00	..	6.00	..	3.11	..	2.66	..	..	....	5.85	....	....	5.51	
..	.71	..	6.43	..	12.14	..	2.14	..	..	..	....	....	40.00	....	....	64.81
..	..	..	..	..	..	..	..	..	..	..	....	....	....	3	4.00	12.00
..	..	..	..	..	..	..	..	..	..	..	....	....	....	1	6.00	4.00
..	..	..	..	..	..	..	..	..	..	..	....	....	....	1	4.00	4.00
38	..	..	..	..	..	..	..	..	..	..	6	6.33	100.	15	6.06	60.00
..	..	..	..	..	..	..	..	.	..	..	....	....	....	1	6.00	4.00
..	..	..	..	..	..	..	..	..	..	..	....	....	....	4	5.00	16.00
..	..	..	..	..	..	..	..	..	..	..	6	6.33	....	25	5.56	
..	..	..	..	..	..	..	..	..	..	..	....	....	23.07			
..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
51	..	..	..	..	..	..	..	..	..	..	6	8.50	46.15	13	7.38	65.00
..	..	..	..	..	4	11	..	..	..	..	4	4.00	30.77	4	4.00	20.00
..	..	..	3	18	..	..	..	..	..	..	3	6.00	23.08	3	6.00	15.00
..	..	..	..	..	..	..	..	..	..	..	13	6.33	....	20	6.50	
..	..	..	15.00	..	20.00	..	..	..	..	..	....	....	50.00			
..	..	..	..	..	..	..	..	..	..	..	....	....	....	2	4.50	6.45
.	..	..	..	..	..	..	..	..	..	..	....	....	....	2	8.00	6.45
..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....
43	..	..	..	..	..	..	..	..	..	..	5	8.60	71.43	20	6.70	64.52
..	..	..	..	..	1	4	..	..	..	..	1	4.00	14.29	2	3.50	6.45
..	..	..	1	7	..	..	..	..	..	..	1	7.00	14.28	5	5.00	16.13
..	..	..	..	..	..	..	..	..	..	..	7	7.71	....	31	5.90	
..	..	..	3.22	..	3.22	..	..	..	..	..	....	....	26.92			
..	..	..	4	..	5	..	..	..	..	..	26	....	....	70		
7.76	..	..	..	..	..	4.00	..	..	..	..	....	6.80	....	....	5.94	
..	..	..	..	..	6.58	..	..	..	..	..	....	....	34.01	....	....	35.18
..	1	..	13	..	22	..	3	..	..	..	82	....	....	216		
7.20	..	5.00	..	6.07	..	3.31	..	2.66	..	..	....	5.15	....	....	5.66	
..	.46	..	6.02	..	10.18	..	1.39	..	..	..	....	....	37.03	....		

The same information is given for all those in the second division, in the first section of which are given those in whom the time was lengthened, while the quantity was increased, lessened, or became irregular. In the second section are those in whom the time became lessened, and the quantity lessened, increased, or became irregular.

Then follow the totals for all cases having fibroids, and also for those having fibrous tumors; and finally there is a summary for all cases of fibrous growth. There is first given the total number for each condition of menstruation, then the average duration of flow, and finally the percentage for each condition calculated on the total number.

There were eighty-four women, or sixty per cent., with fibroids, who averaged 5.28 days' duration of flow, as it had been from puberty. Per contra, fifty-six women, or but forty per cent. only, of all who suffered from fibroids, did undergo a change in the menstrual flow in both time and quantity, and with these the average duration was 5.85 days.

TABLE LI.—*A Summary of* TABLE L.

		No. of cases.	Total number of menstrual days.	Average length of flow.	Percentage for each condition.
Menstruation remaining unchanged from puberty, being	Normal . . .	23	100	4.34	10.65
	Too free . . .	16	110	6.87	7.41
	Scanty . . .	5	24	4.80	2.31
	Total . . .	54	234	4.37	
Menstruation changed in after life, being	Increased . .	109	708	6.49	50.46
	Lessened . . .	35	132	3.77	16.20
	Irregular . .	28	150	5.35	12.96
	Total . . .	172	990	5.76	99.99
Total No. with fibrous growths		216	12,141	5.66	

The second part of Table L., containing the history of fibrous tumors, presents so much in common with that of fibroids, on all essential points, that no further comment or explanation seems necessary.

beyond calling attention to the general increase in the averages for the length of flow.

This table may be condensed and summed up in the following Table LI. We have here the results on the total number so placed that at a glance the average length of flow and the proportion for each condition can be seen.

The percentages for those who remained normal, too free, or scanty would not be likely to vary materially with larger numbers. But when the length of flow changes in after life, the quantity of the flow should be considered in connection with it, and the number of cases should be larger to render the conclusions reliable. By comparing the results based on the time of flow as given in Table LI., with those in Table LII. based upon the quantity, we may arrive at some accuracy in regard to the numbers in whom the flow would be increased or lessened in both time and quantity. A greater difference would necessarily exist between those irregular in time and those irregular in quantity, since the two classes would be influenced by very different conditions.

We will now consider the quantity of the menstrual flow in reference to the changes which it underwent from puberty to the date of the first examination. It must be borne in mind that Table LII. is based upon the changes in quantity, without reference to the time or duration of the flow. This constitutes an important difference, since, as has been said, the duration of flow would not necessarily indicate the quantity. Yet it is essential in the study of these growths to know the condition of the flow as to quantity, the duration being of secondary importance. In Table LII. is given the average length of flow for fibroids and fibrous tumors separately. It will be noted that the numbers do not agree with those of the other tables. The difference is due to the fact, as was shown in Table L., that with a certain number there was no change afterwards in consequence of the presence of the tumor. Between forty-five and fifty per cent. of all these cases had an increase in the quantity of the flow, and in a larger proportion with fibroids than with fibrous tumors. Some seventeen per cent. had the quantity lessened from the average existing at puberty, and the change was the greatest for fibrous tumors. A greater proportion were irregular in the quantity of the flow, but there was little difference in this respect between the two growths. Finally, it is shown that fifteen cases had already undergone a change of life. Less than two per cent. of those with fibroids had gone through the change, while there was over fifteen per cent. for the fibrous tumors. At the first glance this would seem to be a great difference, and yet it is not strange, since a greater proportion [illegible] of fibrous tumors would be met with at a later period of life.

TABLE LII.—*Average Length of Flow, given for Fibroids and Fibrous Tumors separately.*

No. of cases.	Character of growth.	Average length of flow at puberty.	After change in the flow.	Length of flow afterwards.	Percentage for each condition.
52	Fibroid	5.00	Increased	7.26	50.98
35	Fibrous tumor.	4.71		6.88	41.17
19	Fibroid	5.10	Lessened	3.21	18.62
14	Fibrous tumor.	5.38		2.81	16.47
29	Fibroid		Irregular	5.73	28.43
23	Fibrous tumor.			5.54	27.05
2	Fibroid		Ceased from change of life .	. . . .	1.96
13	Fibrous tumor.			. . . .	15.29

This would be an important feature should future observation of a larger number of cases establish the fact that with so large a proportion a change of life takes place through the efforts of nature. It would necessarily have a certain weight in determining a resort to extensive surgical measures at this period of life. All women were excluded who had had a show within a year previous to my examination. The flow ceased at the following ages: with 1 sterile and 1 fruitful woman, each having a fibroid, at 46 years of age for each; as to the fibrous tumors, it ceased with 3 unmarried women at 48, 40, and 51 years; with 3 sterile women at 39, 40, and 48 years; 7 fruitful women underwent the same change at the ages of 46, 30, 47, 54, 50, 46, and 53—making 45.53 the average age for cessation of menstruation in those who had fibrous tumors.

We find that these fibrous growths seem to have had but little influence in lessening the average number of children to each woman. On reaching a certain stage of development the tumor unquestionably caused a number of miscarriages, and finally a condition of permanent sterility. But before the fibrous growths existed, or while yet in their incipiency, these women were unusually prolific. This is true since the average number of impregnations for them is quite as great as that taken on the general average. Thus 1249 fruitful women under observation had given birth to 3550 children at full term, and in addition, had miscarried 1009 times, making 4559 impregnations, or an average of 3.57 pregnancies for each woman.

Eighty-three fruitful women with fibroids averaged 2.34 children at full term, or, including miscarriages, exactly three impregnations for each woman, and in the proportion of 78.31 per cent. of children to 21.69 per cent. of miscarriages. The last pregnancy occurred at the age of 27.63 years, and the condition of sterility had averaged 8.01 years previous to the first examination.

Thirty-four fruitful, suffering in after life from fibrous tumors, gave birth, at full term, to 111 children, an average of 3.26 children each, and including 32 miscarriages the percentage would be 4.20 impregnations for each woman. This would be in the proportion of 77.62 per cent. of children and 22.07 per cent. of miscarriages.

With fibrous tumors, the average for the fruitful at the time of first consultation was 40.28 years, as already given. The average length of time since the birth of the last child was 11.40 years, which would make the average age 28.88 years for these cases, and the last miscarriage to have occurred at the average age of 31.06 years.

By referring to Table XLII., it will be found that the average age of miscarriage was 18.02, for the women with fibroids. Table XLIII. gives 24.68 as the average age for fibrous tumors, and Table XLIV. 21.20 years as that for all cases of fibrous growths. This would give in round numbers 3 children, or 4.20 impregnations in 6.38 years for each woman having a fibrous tumor afterwards.

Should these statistics be confirmed by future observation on a larger number of women, the inference might be drawn that an unusual number of impregnations within a limited time is as conducive to fibrous growths as is the condition of, idleness or absolute rest of the uterus.

Diagnosis of Fibrous Growths.—In the early stages of a developing fibrous growth, a patient will suffer from symptoms like those due to uterine displacement, such as irritation of the bladder, pressure on the rectum, or a general feeling of fulness about the pelvis, with an irregular show, or the menstrual flow too free. The patient is to be placed on the back for an examination, and this should be first made with the index finger of the left hand in the vagina, while using the right one for manipulating over the pubes. The uterus will generally be detected by the finger to be lower in the pelvis than natural, and the first impression will be that the organ is very much displaced either backward, forward, or to one side or the other. But if the examination be continued with the aid of the other hand over the abdominal wall, it will be found that, although the uterus is enlarged, it is more flattened in shape than natural. That is, the uterus will seem much wider or thicker transversely than it should be, in proportion to its apparent length, as felt between the two hands; or the uterus may seem too long for its width. The surface of the enlarged uterus may be found to be irregular, or a grooved surface on opposite sides may be detected, giving the impression as if a large rounded body projected from the uterine wall. The examiner will soon make up his mind as to the existence of a fibrous tumor, or be in doubt as between a flexure of the uterine body and a fibroid on the uterine wall. This point he may not be able to settle without resorting to the use of the uterine probe to determine the direction of the canal. It is customary to state that the presence of a fibrous growth may be mistaken for pregnancy, cellulitis, hæmatocele, extra-uterine pregnancy, or ovarian tumor. One thing should never be mistaken for another, and to avoid this it requires but a few moments longer in the examination; we should not form any conclusion until the investigation has been thoroughly made. Even should the history of the case lead to no suspicion of pregnancy, an enlarged uterus, if movable, should not be mistaken for either of the other conditions. Frequently the growth of a fibroid excites inflammation in its neighborhood, so that the case becomes complicated by cellulitis, and under these circumstances the presence of a fibroid may remain for a time in doubt. But I hold it would be due only to the grossest carelessness should an hæmatocele or the slightest cellulitis exist and not be detected. The reader cannot be too much impressed with the importance of assuming the existence of cellulitis in every case, until the contrary be proved, and then to be on the constant lookout for it afterwards. And I may add this rule is equally an excellent one to adopt in practice, whatever the difficulty may be. An extra-uterine pregnancy is generally accompanied by a slight show from time to time, and the uterus is always enlarged, but a careful examination will readily demonstrate the relation of the uterus to an extensive tumor in one of the Fallopian tubes, or to an abdominal fœtation in the posterior cul-de-sac. No investigation should be considered complete until after a rectal examination has been thoroughly made. The existence of cellulitis may be thus detected, and its extent be more fully appreciated than is possible by the vagina alone. This mode of examination is the only one on which an opinion of any value can be based in regard to an extra-uterine pregnancy, and the sac containing fluid can be thus readily distinguished from the unyielding uterine walls. A small cyst of the ovary will sometimes occupy Douglas's cul-de-sac, and, without the rectal examination, might be mistaken for a fibroid.

If it be deemed prudent, in the absence of cellulitis, to introduce anything within the uterine canal, Sims's elevator may be used for the purpose of forming a diagnosis. This instrument has been already described on page 28, and for this purpose it is far preferable to the sound. It can be passed into the canal, and the intra-uterine stem then secured at any angle by means of the slide. With the aid of this instrument the uterus is brought entirely under the control of the operator. By placing one hand over the abdomen, or with the index finger in the rectum, the uterus can be lifted in the pelvis, or moved in any direction by the instrument, so as to afford an accurate idea of its connection with an ovarian tumor or suspected pedunculated fibrous tumor.

In case of doubt as to the position of the fibroid, and whenever it is advisable to introduce the probe, it had better be done with the patient on the side, and by aid of the speculum. We are to use the instrument simply as a probe, passing it with the same care. When this is done we can arrive at an accurate knowledge as to the direction and depth of the canal. I therefore repeat in substance what has already been stated in regard to the use of the sound, that it frequently excites inflammation; it is attended with more or less pain; and it misleads by making the uterus conform to its own curve. After its introduction it requires but little art in manipulating, by pressing the probe against the sides of the canal, or by use of the finger, to give it the proper curve or direction, and this can be done so as not to cause pain or bleeding. If the probe can be introduced without difficulty, it proves that the fibroid does not project into the canal, but lies deep within the uterine tissue. The introduction of the finger within the uterine canal necessitates that it shall be dilated. This is done by means of sponge tents, and the rules already given for their use must be carefully observed. By means of the finger within the uterine canal, as the organ is pressed down into the pelvis and steadied by the hand over the abdomen, a diagnosis can be accurately formed and the proper treatment decided upon. After ascertaining the size and general situation of the tumor, it will be necessary to determine accurately what proportion, if any, of the tumor projects into the canal, or if the mass has already become pedunculated. But little difficulty will be experienced in obtaining all the necessary information, unless the growth is situated directly at the fundus. When in this position the most dexterous may not be able to reach the base. The plan I follow is to pass into the canal a strong tenaculum along my finger, and then bury it deep into the tissue just within the os. Then as the fundus is pressed down by the hand of an assistant, and drawn to the vaginal outlet by the tenaculum, the finger can be readily advanced by giving it a slight rotary motion. The neck of the uterus can be drawn down to the vaginal outlet with safety, provided it be done by steady traction, without jerking. This position will enable the operator to reach the fundus from the vaginal outlet, unless the tumor is a very large one. It will then be necessary to administer an anæsthetic and to introduce the whole hand into the vagina, by which means the fundus can be reached. Before attempting to pass the hand it should be thoroughly softened in hot water, and well greased. I generally at first press back the perineum for a few moments as far as possible, with two or three fingers, by gentle but steady pressure. If the soft parts be then thoroughly greased, the hand can be introduced by placing the tips of the fingers together in the shape of a cone. But it should not be forced directly in, but advanced by rotating the hand slowly as the perineum is pressed backward. Unless favored by some peculiar condition, not the slightest laceration or danger should follow this mode of examination if it be conducted with due care.

The uterus should always be restored to its proper position after having been thus dragged down, since, if this is not observed, inflammation can be as readily excited as if force had been used in the displacement. A large vaginal injection of hot water is of the greatest value after such an examination, as it will check bleeding, reduce the risk of bad consequences, and, by exciting contraction, will cause the vagina to return rapidly to its normal size.

After the uterus has become enlarged to the size of the later months of pregnancy, a mistake in diagnosis may occur from a careless examination, as between pregnancy, fibrous growth, and ovarian tumor. To fail in recognizing the pregnancy would be unpardonable, with the history of the case, and the certainty of detecting the sounds of the fœtal heart. The fact is that the same rule should be observed, as a matter of precaution, in regard to pregnancy, as I have advised for cellulitis. Pregnancy so often occurs when least expected, and often under such singular circumstances, that I recognize the importance in every case of being always on my guard. Unless the tumor be yet small, the blue appearance of the vagina cannot be depended upon as evidence of pregnancy, since this is simply an indication of a somewhat obstructed venous circulation, and can be brought about by the pressure of a fibrous tumor if it be sufficiently large. Whenever the uterus has become much enlarged from a fibrous tumor, its surface is rarely smooth, and with a little care a number of prominent projections and inequalities can be detected as the result of as many different growths.

The rules for the differential diagnosis between a fibro-cystic tumor of the uterus and an ovarian tumor, and for the treatment, will be pointed out when we come to consider ovarian tumors.

CHAPTER XXVIII.

LOCAL AND GENERAL TREATMENT OF FIBROUS GROWTHS OF THE UTERUS.

Action of ergot, opium, alum, gallic acid, cinnamon—Incision of tumor—Enucleation—Partial removal—Disintegration—Tapping a fibro-cyst.

ALL our efforts in the treatment of fibrous growths are to be directed with a view to their removal, when it can be done with a reasonable degree of safety, or to arresting their development if possible, while we are to preserve the patient's strength by checking the constant tendency to a loss of blood.

That this subject may be made more intelligible to the reader, we will treat of the method for removal after first considering the means to be employed in the general treatment. Different agents have been put forward, from time to time, as efficacious in causing absorption of these growths, but as yet none have fairly stood the test. We are to-day ignorant of any means, other than extirpation, by which a hard fibroid can be removed from the uterine tissue; they do sometimes disappear through the unaided efforts of nature, but we are in the dark as to the exact process.

We have already described the marked difference in the density and character of the tissue forming these tumors. On account of its limited supply of blood, the round and dense fibroid possesses so low a grade of vitality, that little or nothing can be accomplished for its absorption. But we have seen that there are other forms of these growths, possessing more of the muscular structure of the uterus, which are developed faster, and are more vascular. Klebs has described, as we have stated, the mode by which these tissues are left filled with cavities in which large quantities of fluid sometimes accumulate. Experience has taught me that in these cases a great reduction in bulk may sometimes be effected by treatment directed towards promoting absorption of the fluid, and towards diminishing the amount of blood in the growths: but no permanent influence is exerted on the growths themselves. General treatment may also be of service, for no fact is better established by observation than that the development of tumors is delayed by an improvement in the health, while it is always hastened as the general condition becomes impaired.

Drs. Churchill and Savage recommended the use of iodine to promote the absorption of fibroids; Simpson and Wells, the bi-chloride of mercury; Simpson, the bromide of potassium; Rigby and McClintock, the chloride of calcium. The mineral waters containing the bromides have been thought to be efficacious. Ergot has been extensively employed by different methods, but until recently in an empirical manner. Much was claimed for electrolysis when the current was passed by means of long needles introduced deep into the growths. Electrolysis may have been employed in some cases with benefit, but, as a rule, the contrary has been the result, while its use is certainly often attended with danger. This danger consists in the possibility of exciting peritonitis, or inflammation within the tissues of the tumor, and I have known of several deaths to occur in this way. I have seen beneficial results from the long use of small doses of the bichloride of mercury, in combination with an infusion of some one or more of the bitter vegetable tonics, but they were due entirely to the improvement in the general condition. Sir James Y. Simpson held that to secure the full effects of the bromide of potassium it was necessary to employ the remedy continuously for months, and even a year or more. I have had no experience with it thus employed, but from its use for a limited period I have never seen any effect beyond a beneficial one on the nervous system. If its long continued use should have the effect of bringing about absorption of any portion of the tumor, the benefit would likely be but temporary. This I naturally infer, since there is always danger of producing anæmia by the long use of the bromides. The chloride of calcium I have never employed, but beneficial results have doubtless followed its systematic use, probably owing to a calcareous degeneration effected in the tissues of the tumor; but unfortunately it has been found that the coats of the arteries also are likely to undergo the same degeneration.

One cardinal rule is to be observed in the treatment of these fibrous growths: we must do nothing to destroy the vitality of the tumor while it is *in situ*, since we then burden the case with the extra risk of blood poisoning. We may employ any means by which the circulation can be reduced and continued at the lowest point, short of its entire arrest; for this purpose hot-water injections, iodine, and ergot will be found most beneficial.

Much harm has resulted from the injudicious use of ergot in large quantities, but it has not always been recognized that the harm was due to the ergot. As a rule, great benefit is obtained from it when given in small and continued doses, with a view of acting on the coats of the vessels and for exciting only a moderate contraction of the uterine tissue. It should never be given in large doses until after the uterine canal has been dilated, and until it be found that the tumor projects sufficiently to warrant the belief that it may become pedunculated by uterine contraction. I have erred in this respect myself, and have also frequently observed others to do so. Should a tumor be found buried in the uterine walls, or so situated that it cannot become pedunculated, by the muscular contraction induced by the ergot, large doses can certainly accomplish no good. On the contrary, if the uterus be violently excited, and the contractions serve no purpose, an increased quantity of blood will flow to the parts, with the effect, not seldom, of causing cellulitis and even peritonitis. In thus setting up a new source of irritation we establish a condition most favorable for increasing the growth of the tumor.

Ergot has been administered by the stomach, by the rectum, by the vagina, and even injected directly into the tumor; but its introduction by subcutaneous injection is likely to be the method to come into general use.

Dr. Hilderbrandt, of Königsberg, has published[1] a report of nine cases treated in this manner. He used a solution of the watery extract of ergot, in the proportion of three parts to a little over seven parts of distilled water, with the same quantity of glycerine. He found the alcoholic solution of Langenbeck to cause pain, and claims for his solution that it is free from this objection, and is less likely to cause local irritation. He recommended "Pravaz's syringe," but the ordinary hypodermic one will answer perfectly for the purpose. The point of introduction he selected, was in the neighborhood of the umbilicus, as he found this region less sensitive to puncture than the lower portion of the abdomen. In the first case, the tumor was as large as the uterus is at the seventh month of gestation. He employed the injection every day for fifteen weeks, except at the menstrual period, at the end of which time the tumor had disappeared.

A great improvement is reported to have taken place in the other eight cases, but the results were not so well marked. At my request Dr. Bache Emmet employed this mode of treatment in a number of cases, some of which have remained for several years under observation, in order to have its value fully tested. In no single instance did the tumor disappear, but with a number there was a marked decrease in size, while with others no change was noticed. It is evident that only as an exception to the rule is the decrease in size permanent, and the use of the ergot must be continued indefinitely. Nevertheless it often checks the loss of blood, adds to the comfort of the patient, and should be employed as long as this effect continues. From some unexplained cause, in some cases, ergot seems to act as an irritant, and when long continued increases the tendency to hemorrhage.

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[1] Treatment of Uterine Fibroids, by Subcutaneous use of Ergot. Am. Journ. of Obstetrics, Nov. 1872, from the Berlin Klin. Woch., June 17, 1872.

We may look for something in the future from the treatment of fibroids by a carefully regulated diet consisting chiefly of animal food. Dr. Ephraim Cutter, of Cambridge, Mass., has reported[1] seven cases, in all of which a marked change was effected. He states: "For the idea the writer is indebted to Dr. J. M. Salisbury, of Cleveland, Ohio. He regards these growths as pre-eminently due to the excess of carbohydrates, starches, sugars, and fermentable food in the diet; that they are largely disorders of nutrition, and that by feeding patients on a diet composed of animal food, the condition which was most potent in bringing on the diseased results is removed, and the system enabled to right itself by its own recuperative powers." Dr. Cutter gives a carefully selected diet list which might be found also serviceable for other forms of disease. I can state nothing from personal observation on this subject. At my request Dr. Bache Emmet has also made a test of this mode of treatment, and he reports that there had been a marked decrease in size of the tumor, in several instances, but as a rule no effect could be detected.

It is all-essential that the general treatment should be directed so as to include every means adapted to improving the health. The patient should remain in the recumbent position at the time of menstruation, or when accidentally flowing. But at other times she should be as much as possible in the open air, as the chief means at her command for maintaining her strength. When this cannot be done resort must be made to the use of sun-baths to keep up the proper proportion of red globules in the blood.

The preparations of iron frequently seem to increase the tendency to a loss of blood, but if the action of sunlight on the skin be kept up, the remedy will be less likely to cause disturbance. In the treatment of two cases recently, I have been particularly pleased with the marked improvement following the use of Wyeth's preparation of dialyzed iron. In both instances other forms of iron had caused headache and constipation, and an unexpected loss of blood. The condition of the bowels must be a constant care, since the tendency to habitual constipation will increase with the enlargement of the tumor, and there will be a loss of tone in the colon from over-distension. It is, moreover, all-important to avoid any additional pressure upon the abdominal organs, as likely to entail serious consequences in obstructing the circulation in its return from the pelvis to the portal system. If the circulation is impeded it will subject the patient to frequent losses of blood, and aid materially in promoting the growth of the tumor. As the tumor increases in size it will become more difficult to keep the bowels cleared out, or to relieve the constant tendency to the accumulation of flatus which adds so much to the discomfort of the patient. A restricted meat diet would be of benefit under these circumstances, even if it had no direct effect upon the growth; for it furnishes a minimum of excrementitious matter, and contributes little toward the generation of flatus. If the constipation cannot be relieved by regulating the diet, it will be necessary to combine the inspissated ox gall with any other remedy indicated. Much relief will also be afforded by the occasional use of calomel and soda, if the strength of the patient will admit of a prompt action on the bowels. We must not be deceived by the apparently exhausted state of a patient, for the exhaustion may proceed from blood poisoning due to the condition of the bowels, and under these circumstances we can find no better remedy than a brisk mercurial purgative, nor one which will so promptly check an existing hemorrhage in many cases. The tendency to an accumulation in the bowels can be obviated by injecting warm or hot water and ox-gall into the rectum, while the patient rests on the knees, chest, and elbows. The injection will often not all come away by a single action of the bowels, but a large portion may be retained for a few hours in the colon, and the scybalæ will be dissolved by means of the ox-gall.

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[1] "Food as a Medicine in Cases of Uterine Fibroids." Am. Journ. of Obstetrics, Oct. 1877.

In the early stages of fibrous growths it is all-important to correct a retroversion or a tendency to prolapse of the uterus from increased weight. As the growth advances it is necessary also to get the tumor out of the pelvis into the abdominal cavity, and the attempt should not be delayed until after the mass begins to cause disturbance from pressure.

Retroversion will be caused by a fibroid on the posterior wall of the uterus, or, as was first pointed out by Dr. Sims, by a growth situated in front, low enough down to furnish a leverage, by which the fundus may be tilted over by the pressure of the bladder. These displacements must be corrected by the proper application of a pessary, since a fibroid will increase rapidly in size if the uterus be allowed to remain in a position where its circulation is constantly obstructed. When the growth has increased in size to what we have called a fibrous tumor, the fundus of the uterus is sometimes crowded into the hollow of the sacrum, and the os forward above the pubis. At length an increase of size will render it imperative that the position should be corrected, but it will often prove difficult to do this even with the aid of an anæsthetic. Yet, usually, with a little manipulation it can be accomplished by the aid of gravity, which is brought into play when the patient is on the knees and elbows. A tenaculum must be hooked into the cervix, lying behind the symphysis, for the purpose of drawing it upward and towards the vaginal outlet, at the same time that moderate pressure is made in the opposite direction by a sponge probang, through the cul-de-sac against the posterior wall of the uterus. We must, however, bear in mind the fact that sometimes these tissues undergo fatty degeneration from long pressure, and may be then easily ruptured.

Case XXIX.—April 7, 1868, an unmarried woman with a large fibrous tumor was admitted to the Woman's Hospital on the recommendation of Prof. Cabell, of the University of Virginia. In this patient the uterus was very much retroverted by the tumor which was in front, and the organ itself had already reached a size to seriously interfere with the action of the rectum and bladder. I placed her on the knees and chest, and used Sims's speculum to open the vagina. I lifted the cervix by means of a tenaculum, and while I steadied the uterus with a large sponge probang placed in the cul-de-sac without making undue pressure, suddenly the cul-de-sac split entirely across the vagina with as little resistance as would be offered had it been formed of so much wet paper. The air rushed suddenly in through the opening thus made, when the probang, some nine inches in length, was drawn out of my fingers, and, being carried by the current, almost disappeared in the abdominal cavity, whence I succeeded after much difficulty in withdrawing it by means of a pair of forceps. The uterus was replaced by the force of the atmosphere, and the patient was unconscious of any other sensation than one of relief. I placed a sponge in the wound to collect the blood and to prevent the escape of the intestines, as ether was being administered to the patient, who took it without question and in ignorance of the accident. Six or eight interrupted silver sutures were required to close the rent. The woman was placed in bed with the full expectation on my part of an attack of peritonitis, but she had not the slightest disturbance. This accident was witnessed by the entire hospital staff, and by several others not connected with the institution. She expressed great satisfaction for the "operation" I had performed, but it was of little permanent benefit, since the tumor gradully increased in size, and a few years afterwards she died from exhaustion. I succeeded, however, in diminishing the loss of blood for a long time by making a superficial incision along the face of the tumor, as it presented in the uterine canal, extending its whole length, from above as far as it could be reached.

We must now consider in a special manner, and at some length, the different means to be employed for controlling hemorrhage.

Position is of prime importance in its effect upon uterine hemorrhages. A woman suffering from a fibrous growth in the uterus should assume the horizontal position, on the slightest appearance of a show. This rule should be rigidly observed notwithstanding the flow may have made its appearance coincident with the menstrual period. It is necessary to do this that we may offer a check to the current of blood towards the pelvis at the beginning, and thus do much towards breaking up the habit of flowing. When in bed it is also advisable to place the patient on an inclined plane with her feet elevated; by which means the pelvic circulation will be greatly diminished. The room should be kept cool, and the patient quiet.

There are but few remedies for internal administration on whose remedial action any reliance can be placed, and it is doubtful if any would be effective without the aid of both rest and position.

Ergot, opium, gallic acid, cinnamon, and sometimes the tincture of cannabis Indica, are the agents generally employed for controlling hemorrhage. A number of others are usually recommended, but experience has shown them to be of little value. Ergot, as already stated, cannot be relied upon to arrest a hemorrhage, and I have frequently noticed that at the time of the flow, it has the effect of rather increasing the quantity. Unless it be desired to excite uterine contraction, it should be administered only in moderate doses, during the interval between the flows, its action being to lessen the calibre of the vessels, and so aid indirectly in reducing the supply of blood.

Opium is an exceedingly valuable remedy, since by allaying the local irritation, it quiets the circulation through the action of the sympathetic system, and secures contraction of the capillaries, and a diminished loss of blood. It is best administered by the rectum, as it thus enables a tampon to be better borne, and leaves the stomach for such other remedies as may be deemed advisable.

I give gallic acid and cinnamon together; a drachm or two of gallic acid is rubbed up in an ounce of simple syrup, to which four ounces of cinnamon water and three of pure water are subsequently added. Of this mixture a tablespoonful is to be given every two or three hours. If this dose should cause nausea it may be still more diluted, diminished in quantity, or administered at longer intervals, as the flow becomes lessened. These two remedies are more efficacious when given together, than either would be separately, but their use is somewhat empirical, from the fact that we have no definite idea as to their mode of action. Gallic acid has no purely astringent properties, but it is thought to undergo in the system a molecular conversion into tannic acid, and thus to determine the contraction of ultimate fibres. This may be so, but the administration of tannic acid, on account of its primary local effects on the alimentary canal, does not yield the same ultimate results as its congener, although it is excreted as gallic acid. Large doses of cinnamon have the effect of lessening apparently the action of the heart, and the drug may have some properties in common with ergot.

Dr. Churchill and Dr. McClintock both recommend highly the tincture of cannabis indica, in ten-drop doses, three times a day, for arresting uterine hemorrhage. The efficacy of this remedy must be due to such properties as it may hold in common with opium. Dr. McClintock has found some cases of uterine hemorrhage where one-sixteenth of a grain of the bichloride of mercury every six hours arrested the flow, while the same effect was produced in others by pushing calomel to the very verge of salivation.

Opium, gallic acid, and cinnamon may be useful, and should always be tested, but I have found the only reliable means to consist in local applications and measures. These are hot water injections, the tincture of iodine with dilatation of the uterine canal if necessary, and, above all, a tampon, either of cotton saturated with a solution of alum, or one of oakum. Notwithstanding the hemorrhage may be free, I do not hesitate to place the patient on the side, open the vagina by means of the speculum, and then ascertain the direction and curve of the uterine canal, by careful use of the probe. The applicator being properly curved, and a tuft of cotton twisted about it, Churchill's tincture of iodine can be applied to the fundus. Whenever the canal is sufficiently open for the ready passage of the applicator, I loosen the cotton in the manner described in the early portion of this work, and leave it behind until forced out by the uterus. The leaving of this long strip of cotton throughout the length of the uterine canal answers a double purpose. Its first effect is to furnish a nucleus for the formation of a clot, which will control the bleeding. Afterwards when the clot becomes too large, and exerts a sufficient degree of pressure, uterine contraction will be excited, with the effect of expelling both cotton and clot from the canal, and the hemorrhage will be arrested by the compression of the vessels in consequence of the uterine contraction. Sometimes the cotton does not excite expulsive efforts enough to cause its ejection, and it should then be removed on the next day for fear that it may again bring on bleeding by continued irritation of the mucous membrane. Whenever a portion of cotton is thus left within the canal, the precaution should always be taken to have the end projecting from the os for the reasons already given.

When a case is regularly under treatment, the iodine should be injected, a proper curve being given to the nozzle of a hard-rubber syringe for the purpose. Such an instrument is to be obtained, holding about an ounce of fluid, with a nozzle some six or eight inches in length. By smearing the nozzle with a little grease, and with the aid of a spirit lamp, we can easily give it the proper curve. A portion of the iodine to be injected is drawn up into the syringe, and the nozzle then introduced to the neighborhood of the fundus, as a probe would be, by steadying the cervix with a tenaculum. With care, it can be passed without increasing the hemorrhage or causing any irritation. The iodine must be forced out very slowly while the patient lies on the left side, and a sponge, or a mass of cotton, must be placed at the os to prevent the escape of iodine over the vaginal wall. If this precaution be not taken, the flowing of the iodine over a large surface of the vagina may cause the patient much discomfort, and make it difficult to put in the tampon properly. When the strength of the patient will admit of the position, it is better to inject the iodine while she is on the knees and elbows, with the os exposed by the speculum, and she should remain in this position for a few moments. In this way every part of the canal will be reached by the iodine, and it will have the effect of causing the contraction from above downward. A profuse, colored, watery discharge will be caused for a short time, but the remedy, when applied in this manner, has the effect almost always of promptly arresting the hemorrhage, for a time at least. The quantity of iodine to be injected must depend somewhat upon the size and length of the canal, but under no circumstances would more than a drachm be needed. When the long-nozzled syringe cannot readily be procured, a good substitute can be made by using a flexible male catheter tied over the short nozzle of an ordinary glass urethral syringe. There will be some difficulty in introducing the pliant catheter, but this can be overcome by using the speculum, and with the syringe in one hand, portion after portion of the catheter can be passed into the canal by means of a pair of long dressing forceps. The sudden and forcible introduction of a single drop of fluid into the uterine canal, under ordinary circumstances, may be attended with the most disastrous consequences. But the danger is slight here, since the uterus is made more tolerant, and the canal is usually more or less dilated from the partial protrusion of the growth. We may, however, by undue violence, set up inflammation of the tumor, and this condition often causes an attack of cellulitis or of peritonitis.

To increase the action of the iodine a basin or more of hot water must be thrown into the vagina as the woman lies on the back with her hips elevated. The use of hot water will be found an excellent agent of itself if the proper position be observed, the water used at a high temperature, and the quantity large. A steady stream of hot water thrown into the vagina, with the stimulus of the jet to excite contraction, and prolonged for half an hour, will arrest for a time almost any hemorrhage.

The loss of blood takes place from the rupture of some little vessel on the lining membrane of the canal covering the portion of the partially projecting tumor. Pressure will often exert a most beneficial effect by reducing the size and number of vessels. This can be applied by introducing to the fundus, on the point of the sound, an India-rubber cot or bag, and distending it by injecting water into it. These have been described when treating of sponge tents, and the means for dilating the uterine canal. The principle is the same as with Barnes's dilators, but the cots are made of different lengths, with a dilating capacity only to about the diameter of the thumb. The distinctive feature is an idea of my own, and consists in the sound passing through the centre of the dilator in a tube to its extremity. By this means the upper end can be held at the fundus while being dilated so that it cannot slip out, and no power is lost in the vagina as with other dilators. I have suggested that this feature be applied to Barnes's dilators, as it would make them more useful and manageable. When it is possible to introduce this bag to the fundus, we cannot have a better means of controlling hemorrhage. It also renders it unnecessary to forcibly distend the vagina with the tampon, although some packing will be called for to prevent the dilator from being forced out of the canal by uterine contraction. The dilator must be first well lubricated with soap. Its introduction is sometimes greatly facilitated by the use of a whale-bone probe, which will more readily conform to the irregular course of the canal. Unless the object be to dilate the uterus, the India-rubber bag should not be distended beyond what is required to fill the canal; this will usually exert pressure sufficient to arrest the bleeding. I do not wish to impress the reader with the belief that this mode of arresting hemorrhage is applicable under all circumstances. In theory the plan is faultless, but unfortunately the application is sometimes exceedingly difficult. The canal must be somewhat patulous, the condition of the patient such as to warrant the manipulation, and it is necessary that the attempt should be made on a table, and with the aid of a speculum. A stop-cock or a clamp to compress the tube may be used to retain the water, and that is to be placed several inches outside of the vagina so that it can be turned out of the way over the abdomen and caught under the napkin. The continued pressure should not be kept up longer than from one day to another. The water may then be allowed to escape and the bag gently withdrawn. To have this bag distended by air instead of water would be preferable in every respect, but I have not yet devised any means for doing so.

Whenever the canal has been dilated it is a good practice to place the patient on a bed-pan, and with the finger as a guide pass the long nozzle of a Davidson's springe, properly curved, far up into the uterine canal with the view of injecting it with hot water. I state it as the result of a long experience, now extending over eleven or twelve years, in the use of hot-water injections into the uterine cavity, that we possess no better means for arresting bleeding by exciting contraction in both the vessels and uterine tissue. It may sometimes test our ingenuity to get the water within the canal when it is not advisable to dilate it fully, but if we succeed its use is always satisfactory. The remarks which have been made in regard to the danger from injections of iodine, within the canal of a uterus occupied by a fibrous growth, are also applicable to injections of water: they can be safely made if the os is patulous to a moderate degree, and the water is injected slowly and without force.

After injecting the uterine canal or the vagina it is always advisable to again introduce the tampon, unless it is evident, beyond doubt, that the bleeding has ceased. The hot water will cause the vessels to contract, but the pressure of the tampon, if it has been applied before, may still be of service, and it should be continued long enough for them to recover their tone. I am governed somewhat by the condition of the nervous system of the patient, and always continue the tampon for a day or two after the bleeding has ceased, if she shall have been anxious about her condition. After the vaginal injection, and before replacing the tampon, it will add very much to the comfort of the patient to have the whole vagina swabbed out with a sponge probang saturated with glycerine.

There is no objection to the bowels being moved daily, but this is not likely to be the case as long as the tampon is used, nor can an enema be administered with any efficiency if the vagina is fully distended. It will, therefore, be necessary for the physician to make either two visits or to instruct the nurse to remove a sufficient portion of the tampon, by passing the finger into the vagina as a guide, for the use of the knobbed whalebone stick. The tampon should thus be partially removed, and the rectal injection administered just before the expected visit of the physician. He should be punctual to his appointment, since the danger of fresh bleeding is greatly increased by the exertion attendant upon having the bowels moved, and this cannot be guarded against.

Simpson, I believe, first divided the covering of the tumor, by a superficial incision along the uterine canal, with the object of arresting the tendency to hemorrhage. The operation is frequently attended with good results, as it cuts off some of the supply of blood which was conveyed to the tumor through the divided vessels. This plan may be resorted to now and then during the progress of the case, and it always has the effect of exciting the uterus to a firmer contraction on the tumor.

Nélaton, and Baker Brown afterwards, divided the cervix laterally for the purpose of arresting hemorrhage, and the success was due to increased uterine contraction. Frequently this operation allowed the tumor to come down lower in the organ to a point where the uterus would be excited to exert a sufficient force to cause it to become pedunculated.

Various methods have been resorted to for the purpose of removing or destroying the tumor. Thus Velpeau and Amussat were the first to enucleate, or, by force, tear these tumors from their beds. Dr. Sims has been a recent advocate of this practice: he first separates the growth all around, by a stout steel instrument, suited to the purpose, and afterwards removes the mass in sections through a comparatively small opening.

Dr. Atlee, of Philadelphia, instituted the practice of taking out a section from the tumor for the purpose of destroying its vitality, and allowing it afterwards to break down and come away. Simpson was in the habit of introducing a portion of some caustic agent into the interior of the tumor for the same purpose.

Sometimes the membrane covering the tumor is divided from its lowest attachment upward, as far as can be reached, and its attachment freely separated. Then ergot is administered in large doses to cause uterine contraction, that the tumor may be driven out of its bed through this opening.

Other operators do not hesitate to remove any projecting portion of a tumor, which can be reached, trusting to another opportunity presenting itself for removing the remainder, or that it will ultimately become disintegrated.

All these different modes of practice are attended with great danger to the patient from blood poisoning. They should never be resorted to therefore except under some peculiar circumstances and when it may have become simply a choice of the lesser evil.

With my present experience I regard the removal of a portion only of the tumor as an unwarrantable procedure, since, as we shall see hereafter, the whole can be removed with almost as much facility as a part and with less risk.

CASE XXX.—Early in the winter of 1863 a woman almost forty years of age was admitted to the Woman's Hospital with uterine hemorrhage, from which she had suffered many years. She was very anæmic, the lower extremities were œdematous, and her complexion was of a straw color, showing the effect of a continued loss of blood. With the aid of Dr. Winston, at that time house surgeon, the uterus was dilated after some preparatory treatment, for the purpose of forming a diagnosis.

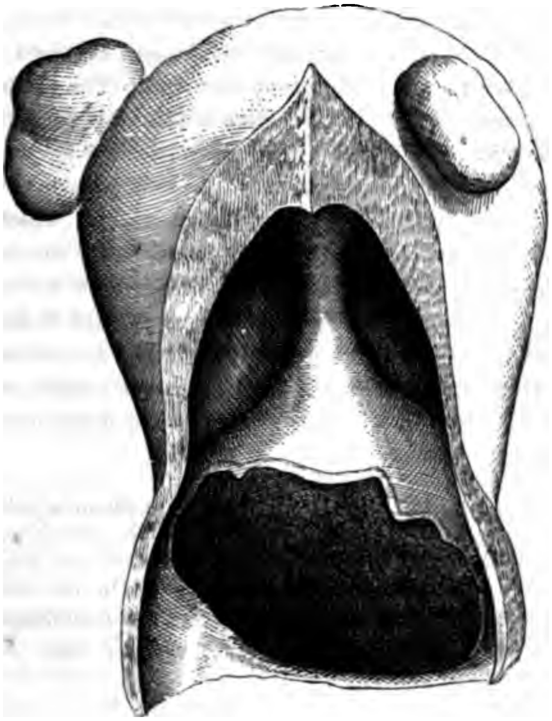
I found a large fibrous polypus presenting at the os, which I could feel was attached to the fundus, but a little in front, and by a broad base.

With little difficulty the chain of the écraseur was adjusted, and drawn tight around the tumor ; I was able to keep it up behind by means of a whalebone staff to be described hereafter.

A mass as large as the closed fist was removed without difficulty or bleeding. I introduced the finger afterwards, and was impressed with the completeness of the operation, the whole surface being smooth, and continuous with the sides of the canal. As the base, although large, was so much smaller than the mass itself I took it for granted that the whole tumor had been removed, and although I noticed the size of the fundus was out of proportion to the rest of the organ, I thought this to be due to the sub-peritoneal fibroids which could be distinctly felt. A profuse discharge was noticed on the second day ; this soon became offensive, and marked symptoms of blood-poisoning presented themselves. Notwithstanding frequent vaginal injections of warm water were employed, but little benefit was derived from them, and she died on the sixth day from blood-poisoning.

The post-mortem examination showed a sloughing mass in the canal attached by so small a pedicle that the slightest force would have removed it. The condition is shown in Fig. 95, from a sketch taken at the time. It was evident that I had cut the tumor in half and that the portion which remained was buried in the uterine tissue. The operation itself excited uterine contractions, by which the remaining portion was displaced. The tumor became more and more pedunculated, as it was forced towards the os uteri, until at length its attachment was reduced so much as to cut off its supply of blood, and the mass began to slough. The action of the uterus would have been sufficient to have driven the tumor into the vagina but for the external fibroids which were found to involve the uterine tissue enough to have caused a loss of power and irregular contraction. Her anæmic condition rendered her more liable to blood-poisoning, and less able to resist its effects. But her life could have been saved if I had suspected the true condition. I had supposed the entire tumor was removed, and then naturally attributed the profuse discharge to the

Fig. 95.



Pedunculated fibroid, partially removed by the écraseur.

large healing surface. I was unable then to do more for her locally than to direct the frequent use of the injections, but these did not enter the uterine cavity. At the present day such a case would be treated by washing out the uterine canal, and then such a mass could not be overlooked.

The study of this case was an instructive lesson, and ultimately led to the plan of treatment which I shall describe hereafter.

It is quite as hazardous to cut into a projecting mass, since the tissues must then slough away, and the danger of blood poisoning would be as great as if a portion were removed. The same objection must exist against exciting inflammation within the structure of the tumor by the use of the cautery, caustics, or other agents, with the view of bringing about disintegration. No man possesses the means of limiting to the tumor the inflammatory process which may be established by this mode of treatment. A number of successful cases have been reported, but were surgeons as diligent in recording their fatal results as they are their successes, it would lead to an abandonment of all attempts to destroy uterine tumors by disintegration.

The following case will illustrate the danger of simply cutting into a projecting mass without any knowledge as to its depth or attachment within the uterine tissue.

Case XXXI.—June, 1871, I dilated the uterus of a patient in the Woman's Hospital, and detected near the fundus a soft tumor about an inch in diameter which was partially pedunculated, and was supposed to have been the cause of hemorrhage. On the anterior wall near the fundus to the right was felt through the abdominal wall a subperitoneal fibroid a little smaller than a hen's egg. This tumor seemed to be on one side, and accidental in its connection with the growth within the canal. Dr. T. G. Thomas, a member then of the consulting board, was present, and examined the case at my request. From its shape and position it was impossible to encircle it with the chain of the écraseur, and it was too soft to be drawn down with a tenaculum sufficiently within reach of the finger, which might serve as a guide for its removal. I therefore decided to destroy it by cutting open with a pair of scissors the portion protruding, and I believe the procedure met with Dr. Thomas's approval. The operation was easily done, and by the injection of iodine the slight bleeding was promptly arrested. The discharge was very profuse after the third day. To guard against blood poisoning I directed the nurse to introduce the nozzle of the syringe just within the patulous os, and gently wash out the uterine cavity at the time of administering the usual vaginal injections. This was done for a week or ten days, and the patient was apparently doing well. One morning during the administration of the injection, the patient suddenly complained of great pain and discomfort.

On removing a nearly empty bed pan the nurse realized that some serious accident had occurred, and I was sent for. The patient died in a few days from a violent attack of peritonitis. The post-mortem disclosed the fact that the sub-peritoneal fibroid had become displaced, leaving a smooth opening as if made with an inch augur, from the uterine canal through the fundus into the peritoneal cavity. The tumor was found lying behind the uterus in a bed of lymph. It was soft, and the portion which had been imbedded in the uterine tissue was ragged and sloughing. Over the opening through the fundus the intestines had become adherent in the attempt to repair the injury. At the time I supposed two distinct growths had existed, and in their development the intervening uterine tissue became absorbed, so that they lay in contact. It was thought, as the growth within the uterine cavity disintegrated, that the outer tumor became involved and loosened from its attachments, so that it was at length easily displaced by the injection. It is now evident to my mind that there was but a single tumor, and I have met with other instances where parts of the same tumor were of a different character.

The question will sometimes present itself as to the proper course to be followed in the treatment of fibro-cyst. The primary fibrous tumor of the uterus may become at length of secondary importance in comparison with the cystic formation springing from it, and frequently it seems to become blighted by the second growth. Fortunately these cysts develop so slowly that many years may elapse before it becomes necessary to interfere. When the distension finally becomes so great as to demand relief, it will be necessary then to empty the cysts by tapping.

This operation is attended, as a rule, with more risk than the emptying of an ovarian cyst. The escape of fluid is more likely to excite peritonitis, and the sac itself is more liable, from its greater degree of vascularity, to become inflamed after being tapped. As a rule, the quantity of fluid accumulating in any one cyst is smaller than in an ovarian tumor, it is, therefore, more difficult to obtain the same relief. The fluid should be removed, when possible, by means of the aspirator and through a small-sized canula. The operator must determine the size by the condition of the case, since if fluctuation be distinct, a small canula will, in all probability, answer. Should the tapping have been successful in removing a large portion of the fluid much valuable information will be gained, to be utilized in case any operation may become advisable. It will be proved beyond question, by future experience, that many of these cases can be relieved by surgical means. If after tapping, for instance, it be found that the fluid was contained chiefly in a single sac, an exploratory operation would be justifiable in case it should refill. By opening the abdomen it may be found that the sac sprung from a point around which a ligature could be placed so as to admit of its removal. I assisted the late Dr. Peaslee, some years ago, in an operation at Astoria, for the removal of a tumor which had been tapped before, and was supposed to be ovarian. In this instance the cyst grew from the fundus of the uterus. A double silk ligature was passed through just close enough to the uterus that the bottom of the sac would be obliterated when it was tied. The sac was then cut off as close to the ligature as was deemed safe, and the abdomen closed as after ovariotomy. This woman recovered without bad symptoms, and there seemed to have been no further development of the tumor.

Extirpation of the Uterus.—The temptation frequently presents itself to perform this operation at the urgent request of some long sufferer, who has at length reached a stage when life itself becomes of little value, and the slightest hope for the future justifies the risk.

To remove the uterus when enormously enlarged from a fibrous growth, is unquestionably one of the most formidable operations a surgeon can be called upon to undertake. The degree of success which has so far attended the operation offers but little encouragement for the future. M. Péan, of Paris, presented, in 1873, seven recoveries out of nine cases where he removed the uterus for fibrous growths. As this success has not been equalled by any other operator, we must suppose it to have been accidental, and that subsequently he himself has not been so fortunate, as already six years have elapsed since his last report. It is true that the difficulties of execution are by no means so formidable as were presented in the early history of ovariotomy, and we have now the advantage of this experience, since there is necessarily much in common in the two operations. But the removal of the uterus with the ovaries, which are taken away at the same time, is attended by a degree of shock only equalled by the most extensive injury to which the body could be subjected. Seeing the results of the operation in this country no surgeon is justified in attempting to remove the uterus for the growth of a fibrous tumor, except as a forlorn hope. The difficulty of diagnosis, however, between an ovarian tumor and a fibro-cyst is sometimes so great that an operation undertaken for the removal of the former may be so far advanced before the true character can be established, that it would be less dangerous to remove the uterus than to discontinue the operation. The uterus has been removed under such circumstances, and frequently through an error in diagnosis, the true condition being detected only after completion of the operation.

With a large solid tumor, the difficulties are far greater than would be the case in the removal of an enlarged uterus in connection with a fibro-cyst. The latter operation approaches nearer to that for the removal of an ovarian tumor, and the shock is rarely as great as with a large fibrous tumor. To guard against a fatal hemorrhage, when the tumor is a large and solid one, it is always necessary to pass a stout temporary ligature as low down as possible, or to apply Storer's clamp before cutting away the mass. Until this is done, no plan can be formed as to the proper manner by which the stump should be secured. With a fibro-cyst, the lower portion of the uterus is often so elongated by the upward traction, that it forms a pedicle, frequently not thicker than that often found attached to an ovarian tumor. This is to be secured by a double ligature passed as near to the vaginal junction as practicable without injury to the bladder. In every respect the after-treatment of the case would be essentially the same as after the removal of an ovarian tumor.

CASE XXXII.—In 1874 a woman applied to me at the Woman's Hospital for the removal of a large ovarian tumor. After a careful examination, and on passing the probe to the depth of seven inches into the uterus, I pronounced the case one of fibro-cyst, and declined to operate. As she was leaving the building, Dr. Sims met her and brought her back to examine her as a matter of interest. He decided that it was an ovarian tumor. I then made a second investigation, and came to the conclusion that Dr. Sims's diagnosis was correct. I was the more confirmed in this opinion from the fact that after many attempts I could never again introduce the probe to a greater depth than two inches and a half. An examination with the finger gave no evidence from the vagina that the uterus was enlarged, but, on the contrary, it seemed rather under size. Drs. Peaslee and Thomas subsequently saw the case, and both regarded it as an ovarian tumor. After opening the abdominal wall, the adhesions were found to be so extensive that I could form no idea of the character of the tumor. It was tapped and freed sufficiently to admit of a more thorough examination. I found it adherent to the bladder, and along the brim of the pelvis to the pelvic fascia. I succeeded in separating it from the fundus of the bladder without rupture, but notwithstanding the greatest care I ruptured the iliac sheath on the right side in freeing an adhesion. There was a single adhesion high up to the rectum, which was in turn separated. The mass which remained evidently included the uterus, but this could not be distinguished. A double ligature was passed and secured at the base of the mass. On making an examination, I found that my first diagnosis was correct, and that I had removed the uterus just above the vaginal junction. The uterus had been drawn out to the length indicated by the passage of the probe, but the canal a short distance up made a sharp curve which I had once by accident passed. The woman never rallied from the operation, and died in a few hours. This case is presented to show the difficulties sometimes met with in making a diagnosis between a fibro-cyst and an ovarian tumor.

CHAPTER XXIX.

SURGICAL TREATMENT OF FIBROUS GROWTHS OF THE UTERUS.

Pedunculated fibroids—Polypi—Écraseur—Removal by traction—By Thomas's serrated scoop—Removal of the ovaries for profuse hemorrhage from fibrous tumors.

Pedunculated Fibroids.—Under certain circumstances it may be good practice to open the abdominal cavity for the purpose of removing pedunculated fibrous growths from the uterus, particularly now that the introduction of the antiseptic method has so greatly reduced the risk of surgical procedures.

As soon as I should be able to satisfy myself of the existence of a sufficient length of pedicle, I would not hesitate to perform the operation, if the pressure of the tumor caused great irritation. A double silk ligature should be passed through the pedicle at a short distance from the uterus, and properly tied. The tumor is then cut away and the abdomen closed as after ovariotomy.

A tumor with a pedicle of sufficient length to admit of such motion would, by pressing on the bladder or rectum, and by displacing the uterus, cause more irritation than even a larger tumor closely attached. It may, by traction, excite cellulitis, or even peritonitis, and may cause effusion into the peritoneal cavity.

Fibrous Polypi.—We are now to consider the most important portion of this subject. Nature often attempts to effect a radical cure of fibrous growths by giving them a polypoid shape, and experience has demonstrated that art can supply no safer or more effective method than that suggested by nature.

We have already explained the method by which a tumor lying near the lining membrane becomes ultimately forced out of its bed into the uterine cavity. Fig. 95, page 563, represents the appearance of this attachment by a pedicle. This pedicle, or stalk, connecting the tumor to the uterus contains little else than small bloodvessels, a little connective tissue, and the lining membrane which the tumor carried before it. Owing to peculiarity of structure a polypus may have so short a pedicle as to remain in close contact with the surface from which it has been expelled. Under other circumstances the pedicle will be drawn out to a great length, so that the polyp may remain within the uterine canal, or be expelled by the uterus into the vagina without breaking its connection. I have seen an instance of a fibrous polypus, as large as a walnut, hanging out of the labia, and connected with the uterine wall by an attenuated pedicle. But, as a rule, the little artery by which it is nourished becomes at length so stretched that the supply of blood ceases, and the tumor then begins to slough in the vagina. This is a very frequent course of the efforts at a spontaneous cure, and the mass may come away as a whole or gradually disintegrate. Cases are occasionally found with the polypus projecting from the os uteri, where no hemorrhage has occurred, and often not even a leucorrhœa has been noted. In other instances the hemorrhage gradually ceases as the tumor is driven out of the uterine canal into the vagina, where it may remain without producing irritation. A polypus in this condition, if sufficiently nourished, may have its investing membrane undergo a change so that it will resemble that of the vagina.

A polypus projecting from the os uteri cannot be mistaken for any other condition than an inversion of the uterus, and it would be well for the reader, in this connection, to consult the chapter on that lesion.

So long as the tumor remains within the uterine cavity no accurate diagnosis can be made until the os is dilated sufficiently for the introduction of the finger. The directions which have been given for dilating the uterus are sufficiently explicit, and need not be repeated.

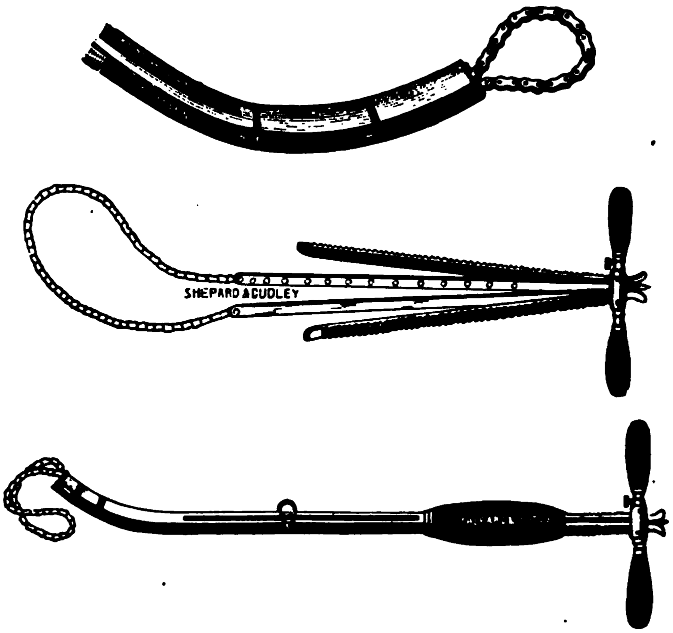
The most important points to be first determined in regard to a polypus are its position and the size of the pedicle. When the attachment is to the walls of the uterus, the lower portion, at least, can generally be felt, and then, with a knowledge of the depth of the canal beyond this point, as shown by the probe, the size of the base can be ascertained with accuracy. In other words, *the attachment always extends to the fundus from the lowest portion within reach of the finger*. The movement of the sound in different directions about the tumor will also aid in the diagnosis. With the finger of one hand within the uterus, touching the lower portion of the base, and with the other over the abdomen, we can gain a knowledge of the size of the tumor. When the attachment of the polypus is to the fundus it may be very difficult to reach it, and we may not be able to gain any accurate information as to the size until, at the time of the operation, the tumor is dragged down for its removal. The degree of rotatory motion which can be given to the tumor by the finger is a valuable indication as to the size of the pedicle; of course, the smaller the pedicle in diameter the more freedom must exist.

No preparatory treatment is necessary for the operation beyond evacuating the contents of the rectum and bladder. Formerly the general practice was to pass a ligature around the base of a polypus, and day after day it was tightened, generally by twisting, until, at length, the cord would cut through the mass as it sloughed. Dupuytren was the first to remove uterine growths by dividing the pedicle with scissors, but, through fear of hemorrhage, this method has never become general.

The removal by ligature or torsion continued to be the practice until Chassaignac devised the écraseur for the removal of hemorrhoids, when this instrument was adopted into this branch of surgery. It encircles the mass by a chain loop which crushes its way through as it is reduced in size, and by lacerating instead of crushing the tissues lessens the liability to hemorrhage. Afterwards other instruments were constructed on the same general principle, with a wire substituted for the chain, on account of the difficulty of applying the chain; and the greater ease with which a loop of wire can be applied around a tumor within the uterus. Sometimes, it is true, the wire loop can be managed with more facility, but altogether it possesses no advantage over a well-made chain; and I have found that it is more liable to break when subjected to the same degree of strain. To better adapt the écraseur for this branch of surgery it is sometimes given a curve to conform somewhat to the relation of the uterus, with the vaginal axis. But frequently the tumor within the uterus is so situated that when the chain is tightened it acts almost at a right angle to the instrument, with the effect of rendering the strain greater as the loop is shortened and the instrument was thus often broken.

To obviate this and other difficulties, I had an instrument constructed some ten or twelve years ago on a plan of my own, of which an important feature was the placing of two or three joints at the end of the instrument, so that it may remain straight or bend upon itself at a sharp angle. The instrument in general use, under some circumstances, where it cannot adjust itself, cuts off a mass obliquely, which can never happen on using one with these joints. Instead of the chain being joined to the ratchet portion, as in the original instrument, this is separated into two parts, and between them two flat rods or bands, to which the ends of the chain are attached, slide through to the handle where they are secured by a spring-catch. The object in having the ends of the chain attached to rods which can be separated is to facilitate the passage of the chain around a tumor when the latter is beyond the reach of the finger (see Fig. 96).

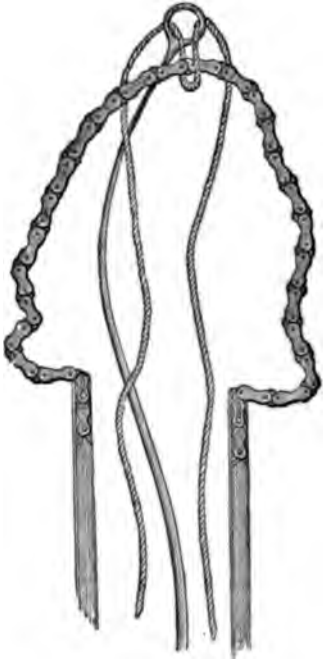
Fig. 96.



Emmet's écraseur.

Fig. 97 represents a copper sound for carrying the chain around the tumor; it has a small circular eye at the extremity made by bending the end around and soldering it. Instead of this sound a flat piece of whalebone with an opening or eye at one end may be used, it should be soaked in hot water to prevent splitting when the hole is made, and the edges should be rounded or smoothed down by means of the sharp edge of a piece of glass recently broken. It makes a very good substitute for the copper sound, and the instrument I first employed was made of it. Through the eye both ends of a strand of catgut are to be passed with the chain caught in the loop, as shown in Fig. 97; they should be long enough to reach the handle of the instrument when they are drawn tight. If a polypus is attached to the anterior portion of the uterus, the copper guide should be first bent to about the proper curve, and then passed to the fundus behind the tumor, as the woman lies on her back with her legs flexed. If the two ends of the cord be held taut, the loop of chain will of course be carried up to the same position, or it can be carried up afterwards by making traction on the cord. The instrument is then to be handed to an assistant, who will keep it and the ends of the cord out of the way by making pressure backward against the perineum. The operator now takes in each hand one of the rods to which the end of the chain is attached, and after passing up one on the right of the tumor and another on the left, the two are to be brought together in front. When this has been done, the two rods are secured together as one piece, by the pins and socket holes at the opposite end near the handle. After they have been properly joined, they are to be pushed down the sheath of the écraseur. On the sheath slides a spring-catch, resembling in appearance a stop on a cornet à piston, and this slips into one of a number of holes on the upper surface of the rods, enabling them to be drawn back until secured by a catch in the handle. On the under side of the instrument is the usual slide by which the ratchet surface is fixed and made ready for work. As the chain is held up by the instrument on the distal side and drawn tight it encircles the base of the tumor close to its attachment all around. The guide is then removed, and if the catgut strand does not follow by moderate traction made on one end, it may be allowed to remain. A small cord would answer, but the catgut is preferable in being less likely to catch in the joints of the chain. The device of constructing the ratchets, so that they can be separated, secures a great leverage at the handle of the instrument. I have used the écraseur but little, from the fact that I had already, years before its conception, substituted the use of the scissors in some form for almost every operation in this branch of surgery. The écraseur is an efficient instrument for the removal of polypi, but not an essential one.

Fig. 97.

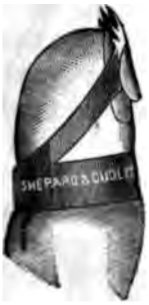


Mode of adjusting the écraseur chain.

After having satisfied myself that the case is not one of inversion of the uterus, I pass up alongside of the index finger a strong tenaculum and then hook it deeply into the body of the polypus. This will allow the operator to draw down the tumor with one hand while he retains the finger of the other hand within the uterus. At length the point of attachment will be reached, for the tumor will soon be forced lower by the uterine contractions which are excited on making traction. The assistant is now to hold the tenaculum, while the operator passes up a pair of properly curved scissors along his finger to the base of the tumor, for the purpose of dividing the pedicle.

Figure 98 represents the enucleator, a steel instrument terminating in a serrated edge, which is to be put over the extremity of the index finger to take the place of the finger nail in separating tissues. The finger is kept from slipping forward by the little hood just behind the saw catching over the nail. The extremity of the finger in front is left uncovered, so that the sense of touch is not interfered with, and the serrated tip can be directed with as much accuracy as if the finger nail was used. I have never tried this instrument with a cutting edge instead of the serrated tip, but I have no doubt that it might be useful. Whenever the space is so limited that the finger cannot be used as a guide to direct the course of the scissors, this enucleator can be employed to great advantage. It will separate the tissues as rapidly as by any other means, provided the serrations are properly made and the parts are kept on the stretch. But it can be used for little more than dividing a pedicle, as the finger soon becomes tired and cramped from the tight fit of the band around the finger, which is necessary to prevent the instrument from slipping off. One rule to be observed when the pedicle is being divided is, that if it is small in diameter it may be cut through close to the uterus, but if short and broad, the separation should be made near the tumor, for fear that a partial inversion or indentation may be caused by the traction. I have known of two instances in the practice of others where the uterine wall has been perforated from too close division of the pedicle. Under ordinary circumstances it is not necessary to remove the entire pedicle, for if a portion is left it soon shrinks and disappears. The after-treatment will be described in the next chapter while detailing the history of some prominent cases.

Fig. 98.



Emmet's enucleator.

Removal of Fibrous Growths from the Uterus by Traction; and After-treatment.—From observation I have come to the conclusion that fibrous tumors become pedunculated only when situated at a point where the force of gravity comes into play. This force tends constantly to excite the muscular fibres of the uterus to contraction.

I have observed that the muscular fibres do not contract equally throughout the whole organ. From some change of structure, due in all probability to the long-continued pressure of the tumor, the external fibres of the wall of the uterus, where they cover these growths, lose to a great extent their contractile power. In corroboration of this supposition, I have noted that when marked uterine contraction is excited an apparent sinking in of a portion of the sub-peritoneal surface frequently takes place, corresponding in extent and locality to the interstitial tumor beneath. If the contraction be prolonged, the area of the depression will diminish just in proportion as the tumor is forced into the uterine canal. About the circumference of this inactive segment of uterine tissue the muscular action is more marked than at any other point; and indeed it is not unnatural to expect that the greatest action should be in proximity to the seat of irritation. This inactive region, when thus encircled by a contracting band, is progessively crowded in upon, and contracted in extent as rapidly as the tumor advances into the uterine canal. I have felt this depression distinctly when the uterus was in a state of active contraction, but it has been a question in my mind if any real displacement of uterine tissue takes place until the greater portion of the tumor has already been forced into the vagina. I am rather inclined to the opinion that a circular ridge is formed by the damming up, as it were, of the contracting muscular tissue over and about the part.

When a tumor is situated at or near the fundus we can hasten the termination of the case by exciting contraction in the muscular fibres by the use of ergot, as is the accepted practice; or we may aid the action of gravity to excite this uterine contraction, by dilatation of the os uteri or by incising the cervix. But there are many cases where the tumor is not so favorably situated, and in which the action of gravity cannot be brought into play, and where the uterine contraction would be lost or would be unable to displace the tumor from its bed.

For the relief of a large number of these cases I have excited uterine contraction by making traction on the growth in the direction of the outlet, until the tumor becomes pedunculated, from being crowded out of its bed by muscular contraction around and behind the mass.

This action may be illustrated by the removal of a body from a mass of India-rubber. If the rubber were stationary, and sufficient traction were made by a tenaculum on the body buried in the mass, the process would be similar to that by which a tumor becomes pedunculated. We have substituted force for the action of gravity, and the natural elasticity of the rubber may be likened to the muscular action of the uterus. Now, when the body is drawn out from the mass it brings with it a portion of the rubber in the shape of a pedicle and no cavity will remain, since the elasticity of the rubber is sufficient to cause it to close in behind pari passu with the advance. And so when traction is made on a tumor, with the effect of exciting sufficient muscular action, the space which was filled by the growth will become immediately obliterated; or, at least, there never will remain more than a small and unimportant cavity. My attention has been directed to this subject for a number of years, but the development of my views and practice to the present standpoint has been very gradual.

The following case is of interest as the initial one in this practice, and represents an important feature in the history of the subject:—

Case XXXIII.—In 1863 a patient was admitted to the Woman's Hospital with a fibrous tumor, distending the uterus to a size equal to that at full term, a portion of which filled the vagina and had already begun to slough. I could form no idea by a digital examination as to its attachments. I applied a pair of forceps, with a view of bringing down the mass so that I could reach its base, around which I intended to apply the chain of the écraseur. My efforts, however, were fruitless, as the tumor was too large above to enter the pelvis. Fearing to leave the patient in this condition, I passed, with the aid of Gouch's canula, a stout twine around the mass, as high up as I could, within the uterine cavity. At the end of the cord I made a slip-knot and strangulated the mass to control the hemorrhage which I anticipated. Steady traction was made on the cord by an assistant, for fear that hemorrhage would occur should the noose become relaxed. I proceeded to remove the mass, piece by piece, with the aid of a large tenaculum and a pair of properly curved scissors. After I had taken away a large portion, I was surprised that the mass was in no wise diminished, and I was so much occupied with the work immediately before me, that I did not notice the gradual decrease in the size of the uterus until near the close of the operation. As I advanced, the cord was cut by accident. As there was no bleeding, I introduced my hand within the vagina and proceeded with the operation by pulling down with the tenaculum portion after portion, until the pedicle was reached. I thus removed the whole tumor with scarcely the loss of an ounce of blood after the traction had been commenced. I noted that the mass remained blanched in appearance after cutting the cord, just as the strangulated portion did after the blood which it contained had escaped. It was a matter, also, of the greatest surprise to me, for which I could offer no explanation, that the pedicle for such a mass should not have been larger in diameter than the index finger.

Previous to the operation I had supposed the greater portion of the tumor was buried within the uterine tissue. At the termination of the operation the uterine canal was barely five inches in depth. The mass contained a number of cysts of various sizes, and the quantity of fluid which escaped could not be estimated, but the pieces of the tumor weighed together nearly seven pounds. The patient recovered without a bad symptom.

Different operators in France and Germany have employed the scissors to divide the pedicle of a polypus, but the chain or wire écraseur has been generally used in Europe and in this country. The écraseur has also been employed for removing as large a portion of a tumor as could be included within the chain of the instrument, but I have found no case on record similar to the above. This case seems to have been the first in which the tumor was gradually pulled down and removed, piece by piece, with scissors as I have described. For years this procedure was practised only by myself, although every operation had been witnessed from time to time, by different members of the profession. Prof. Wm. T. Howard, of Baltimore, was the first to put it into practice after myself, and others have employed it since. The success of the operation in this case was instrumental in bringing the scissors into more general use for this branch of surgery.

Case XXXIV.—February, 1867, a patient was admitted to the Woman's Hospital with a large fibrous tumor imbedded in the greater portion of the anterior wall of the uterus. The tumor encroached on the uterine cavity, but only so far as to give a marked curve to the canal, nearly the whole mass being interstitial. The case was under the care of Dr. John G. Perry, then one of the assistant surgeons, who, by my advice, continued the use of sponge-tents for some two months or more. After an absence of several weeks she returned to the hospital in consequence of continued pain from uterine contraction. The os was found dilated to some four inches in diameter, and the tumor presented like a child's head. A broad attachment could now be felt just above the vaginal junction, somewhat less in width than the portion of tumor occupying the canal, while previous to leaving the hospital merely a uniform projection existed. June 8, I operated by passing well up into the canal a large tenaculum, and by steady traction drew down, or rolled out, into the vagina a large portion of the mass. I took out with a pair of scissors a large wedge-shaped portion, and as the traction had already excited uterine action, I removed piece after piece, as the tumor could be drawn down, until the uterus was emptied. When the pedicle was divided it was less than half an inch in diameter, and was formed by the capsule covering that portion of the base of the tumor which was nearest to the uterine outlet at the beginning of the operation. The location of the pedicle at the lowest point, I have noticed, has been without an exception. I have referred to the recorded history of the case, and find that the depth of the uterus was not noted, but my impression is that it was eight inches previous to the operation. The lower portion of the base was felt just within the cervix, and the attachment of the tumor extended from that point to the fundus. The base therefore could not have been less than seven inches in length, with a width of from three to four inches. I purposely commenced the traction as high up as possible, and away from the lower portion of the base. I excited muscular action at the fundus, where it seems always to be greater than in any other part of the organ. As I rolled out the tumor from above, its separation advanced from this point downward as the uterus contracted on the diminishing size of its contents. The portions of this tumor weighed together four pounds and a half.

Case XXXV.—A case similar to the first one [Case XXXIII.], was admitted to the hospital in 1869, in the service of Dr. George T. Harrison. The vagina was filled by a portion of the tumor, which had begun to slough, and the patient already presented the symptoms of blood-poisoning. I used a cord for the purpose of making traction in the beginning, but afterwards drew down the tumor as I have described, and removed it piecemeal. The pedicle was not larger than the index finger, yet previous to the operation I am certain that fully one-third of the tumor was interstitial. This seemed to be the case, at least so far as an opinion could be based on the passage of the sound as an indication of the depth of the uterine canal. This tumor was also filled with cysts and their contents lost, but the portions removed weighed a little over five pounds.

Case XXXVI.—March, 1874, I received in my private hospital from Dr. D. E. Kissam, of Brooklyn, a patient who had long suffered from excessive hemorrhage. She was so anæmic that for nearly a month I directed my attention to controlling the loss of blood and to improving her general condition before I deemed it safe to attempt any operative procedure. The uterus was very much anteverted, enlarged at the fundus, and somewhat pear-shaped. The sound passed five inches posteriorly to the base of the tumor and three inches in front of it. As soon as the condition of the patient admitted of doing so, I dilated the uterine canal fully, and reached the lower portion of a tumor having a base below of some three inches wide. Every other day I dilated the canal and passed high up within it an ergot suppository. One was introduced also into the rectum every night, and on alternate days in the morning as well as at night. These were made by Dr. Squibb of gelatine, glycerine and sufficient aqueous extract of ergot, to be equivalent to one hundred grains of the powder. Marked uterine contraction followed the use of these suppositories, the effect was more decided when they were introduced directly within the uterine canal.

A practical point has been overlooked in the treatment of these cases, should it be proved that the absorbing power of the uterine lining membrane is always as active as it seemed to be in this instance. Iodine, for example, as we all know, is taken up so as to be detected by the taste of the patient almost instantaneously. This is the only case in which I have used these suppositories within the uterus, but do not think they could have acted merely as a foreign body, because of the rapidity with which they were dissolved.

The uterus became broader at the fundus, from before backward, and altered in shape so much that a projection was formed on the posterior wall as the tumor was crowded in that direction; but no advance was made toward the uterine outlet, nor did the base lessen in diameter. At the end of about ten days I felt satisfied that nothing more could be gained by delay. Although the os below was kept fully dilated, the expulsive power accomplished nothing, as in a shoulder presentation. No advance could be made, as, from the situation of the uterus and the tumor, the action of gravity could not be brought into play. I placed the patient under ether and decided to remove the tumor with scissors, but at the end of an hour I was obliged to abandon the attempt. I could barely reach the most depending portion of the tumor with my finger, and failed to get a loop or any contrivance around the growth by which I could draw it down. March 3d, a week later, in the presence of Drs. Kissam, George T. Harrison, and Bache Emmet, I again made the attempt. I first retroverted the uterus, and then gradually drew it down to the vaginal outlet. When necessary the uterus may be thus brought with safety within reach, if no cellulitis has existed, and if the movement has been made by gradual traction without jerking. The uterus was held in this position by a stout tenaculum in the hands of an assistant. I then passed the index finger, as a guide, within the uterine cavity, and seized the fibroid high up posteriorly with a double tenaculum. By steady traction in the course of half an hour I succeeded in drawing a portion of the tumor through the os, and for the first time was able to pass my finger around the base. The tumor was a half spheroid in shape, situated near the fundus in the anterior wall, about three inches in diameter at the base, and unusually dense in structure. To give more room I removed with the scissors the portion which had been drawn out from the os. Introducing my hand within the vagina and the fingers into the uterine cavity, I made traction on the mass with a tenaculum in the other hand. I requested Dr. Kissam to place his hand over the fundus to steady the organ and press it down into the pelvis. The uterus was now contracting with great force, and as I crowded my fingers in around the base to aid the process of pedunculation, if I may use the term, I could feel the contracting wave passing in a spiral or an oblique direction around the uterine walls. The muscular contraction was more marked immediately around the base where it seemed to crowd up on the tumor. Suddenly Dr. Kissam informed me that the uterus was becoming inverted, and I noticed at the same time that the base of the tumor was lessening in diameter. I passed my hand over the abdomen, and as the uterus contracted I could feel the cup-like depression distinctly through the relaxed ab-

Menstruation had been free, lasting a week, and she was seeking relief for a profuse leucorrhœa, with constant bearing-down pain and backache. The doctor had examined the case and reported the existence of a large mucous polypus projecting from the os uteri. The speculum exposed a soft vascular growth as large as an English walnut, with an attachment to the posterior lip almost as great. There had been double lateral laceration of the cervix, and although this growth was outside of the uterine cavity, it really sprang from a surface which formed a part of the cervical canal before the accident. The appearance of the tumor was unusual and led to further examination. I found the uterus very wide from before backward for its apparent depth, and by the rectum I detected a deep depression near the fundus, as if from inversion. But the passage of the sound forward five inches indicated the presence of a fibrous tumor in the posterior wall, extending nearly to the fundus without encroaching on the uterine canal. The growth was very soft, and bled profusely in consequence of the tenaculum tearing out on making the slightest traction. I therefore resorted to my favorite means for the purpose—a cord with a slip-knot. The tissue of the pedicle, which had been drawn out, was dense, and I soon discovered that it was inclosed within a sheath having an origin deep within the uterine wall. I divided with the scissors the sheath around the supposed pedicle, close to the uterine surface, and proceeded to make traction as I separated the tissues with my index finger. I was soon satisfied that it was a portion of the fibrous tumor occupying the posterior wall of the uterus, and having advanced so far I had no alternative but to enucleate the whole tumor. In the course of half an hour I succeeded in drawing out a mass some four inches in length, an inch and a half in diameter, round, and of nearly uniform thickness throughout. In the beginning, while making steady traction, I confined myself to separating the tumor from the tissues as it presented itself at the opening. The hemorrhage was profuse, and increased so rapidly when I had withdrawn about half of the tumor, that I hastened the operation by introducing my finger and breaking up its attachment in advance. After the mass had been removed I found the cavity was two inches and a half in depth, and the remaining posterior wall of the uterus so thin that I was surprised it had not been ruptured. An equally thin septum existed in front, between the cavity and the uterine canal, which had not been entered. The traction had excited the muscular uterine tissue to action, and the size of the organ had materially lessened; but the posterior wall being so thin, the contractile force seemed lost in that direction. Notwithstanding the depth of the cavity had been shortened an inch and a half, it was my impression its capacity had been but little diminished, since its width was greater than that of the tumor after its removal. A portion of what seemed to be a capsule presented at the opening, and I seized it with a tenaculum, and, drawing down that portion which was loose, removed it with the scissors. The patient was now placed on her back, over a bed-pan, and the cavity washed out with a quantity of very hot water, by means of a Davidson's syringe. She was afterwards replaced on the left side, and Sims's speculum introduced, as at the time of the operation. The cavity was dried by a large sponge probang, and as soon as it was withdrawn, two drachms of Churchill's tincture of iodine were injected. By use of the hot water the size of the cavity was greatly reduced and the bleeding diminished, but the iodine contracted it still more, and entirely arrested the hemorrhage. Some pledgets of cotton saturated with glycerine were introduced into the cavity, now about an inch and a half in depth, and the vagina was moderately tamponed with cotton dampened with a solution of alum. On the second day after the operation all dressings were removed and the cavity carefully syringed out with warm water, to which had been added some carbolic acid. This treatment was continued from day to day without a bad symptom presenting, and the cavity rapidly decreased in size. December 19th, eleven days after the operation, the temperature suddenly rose to 103°, and symptoms of blood-poisoning were detected. A speculum examination was made, and a sloughing mass exposed, which at first glance appeared to be the posterior lip. I found that it was a portion of what had been thought to be the capsule protruding, behind which a cyst had formed, containing about two ounces of a thick gelatinous fluid. After puncturing the cyst I removed the remains of the covering by means of scissors, and by tearing it away with a strong pair of forceps. There was some bleeding, but the quantity was not excessive. Curiosity prompted me to pass my finger to the bottom of the cavity, when I detected another fibroid, a little smaller than a pigeon's egg, just projecting sufficiently for me to map out its size. This I seized with a strong tenaculum, and as traction was made by Dr. Whitwell I cut it out from its bed with a pair of curved scissors. The uterus contracted promptly on its removal, and it was beyond question due to the presence and position of this little fibroid that the cavity had not been more reduced in size at the time of the first operation. I again injected the iodine, and as it excited the uterus to further contraction the bleeding was entirely arrested. January 7th, I found the cavity from which this tumor had been removed now obliterated, and the uterus three inches deep. On the 12th instant she was discharged from the hospital cured.

Pathologists teach us that the dense fibrous tissue which formed the mass of such tumors has a very different origin and history from the soft and vascular growth found projecting into the vagina, and which they say springs only from a mucous surface. But I have met with another instance like the above, where an apparent mucous growth merged so gradually into the dense tissue of a true fibrous tumor that a line of demarcation could scarcely be drawn. And I think a third case might be cited in one which I have already presented (Case XXXI., page 564), as illustrating the danger of cutting into a growth while ignorant of its connections. This case will be recalled by the fact that the subperitoneal fibroid became detached, leaving an opening between the uterine canal and the peritoneal cavity. But in this case a doubt may justly be opposed as to the condition being proved, for it is possible that the inflammatory process set up in the tumor, by cutting into it, may have extended to another fibroid lying in contact with it.

But there can be no doubt of the fact that, in the other cases, this soft tissue was continuous with and sprang from the fibrous tissue. In both instances the specimens were unfortunately lost, so that no microscopic examination was made to ascertain the true character of the tissue.

These cases seem, in the absence of other light, to indicate that this fibrous tissue sometimes undergoes structural changes, depending upon position and surrounding circumstances. It is, therefore, probable that this dense tissue which had been long subjected to pressure from uterine contraction may, if freely supplied with blood, become in time entirely changed in character after being relieved from this pressure. If this be not true we must assume that the growth was sarcoma, and yet, in the first instance, seven years, and in the other nearly four years have elapsed since the operation, without a return of the disease.

The mass projecting into the vagina had, of course, a capsular covering, consisting of the endometrium and a small quantity of connective tissue. But the portion of supposed capsule left in the cavity was simply an outer lamina of the tumor itself. In fact, it was the appearance of the tissue in this case which first suggested the doubt in my mind as to the existence of a capsular covering for these tumors. My opinion now is that the tissue, which at any time seems to be a capsule, may subsequently become a part of the tumor proper, and be covered in by new accretions, if the mass continues to grow.

In Case XXXVII. the pressure of the little interstitial fibroid unquestionably interfered with and limited the proper degree of uterine contraction, so that quite a large cavity remained after the operation. These single tumors exercise a very important influence, which the obstetrician as well as the surgeon should fully appreciate. I am satisfied that many cases of apparent atony of the uterus and of irregular action, as in the hour-glass contraction, are due to the presence of isolated fibroids, so situated as to obstruct the proper contractile action of the uterine tissue.

The following case will be of interest in this connection, and to show the uncertainty which must exist as to the depth to which these tumors penetrate the uterine tissue.

Case XXXVIII.—Some years ago I assisted Dr. Cutter in Newark, N. J., in removing a large tumor from the uterus. A portion of the growth presented through a well-dilated os, and the lower portion of the attachment was within reach on the anterior wall, some two inches within the canal. I passed the chain for him around the growth, but as it was being attached to the instrument it slipped from the fingers, and it became necessary to re-apply it. The chain was again adjusted and finally attached to the écraseur, after great difficulty, by her physician, from the fact that it seemed to include a much larger portion of the mass than before. The hemorrhage was excessive from the beginning, and increased to such an extent that it became necessary to remove the mass as rapidly as possible. To control the bleeding, ice-water (it being convenient) was injected into the uterine cavity to excite contraction. This was promptly established, but the bleeding was not arrested, and the condition of the patient became critical. As soon as the écraseur had cut through and had been withdrawn, I passed my hand within the uterus, and found its cavity occupied by two tumors, the one above overlapping the other. When I applied the chain it passed between them and encircled the lower one, but a portion of both was included in the last adjustment. Passing my hand over the abdomen, I felt a sub-peritoneal fibroid as large as a hen's egg, on the anterior wall near the fundus, and to the left. I was satisfied the uterus could not contract sufficiently to control the hemorrhage, with so large a mass attached to its wall and filling its cavity. I therefore attempted to break down and tear away with my fingers the remains of the tumors. This brought on violent uterine contraction, but irregular in course, so that the organ assumed somewhat the hour-glass form. I felt the canal suddenly encroached upon, and on placing my hand over the abdomen found the external tumor had disappeared. I attempted to enucleate the presenting mass by opening the tissue with my thumb-nail, when it split, and the tumor escaped so suddenly from its bed that my first impression was that rupture of the uterine wall had occurred. The uterus now contracted uniformly and rapidly, so that the remaining masses were soon removed, and the hemorrhage arrested. This patient convalesced slowly owing to the great loss of blood, but she ultimately recovered.

I am satisfied that this supposed sub-peritoneal fibroid was embedded in the tissue of the uterus nearly to the lining membrane of its cavity. Fortunately, by the uterine contractions which were excited, the tissues crowded upon the tumor so as to force it in the direction of the canal, and, although it left a very thin septum of uterine tissue beneath the peritoneum, the space was soon closed up by the rapid decrease in the size of the uterus. Had the uterus but partially contracted and this tumor had become displaced, an opening would have remained between the uterine canal and the peritoneal cavity.

Moreover, if the portion of this tumor, lying so close to the uterine canal, had become inflamed, the whole mass would have been loosened with a result similar to the case already cited.

I had removed eleven or twelve large tumors by this method, and a number of small fibroids, with but a fatal result, until the following case was operated upon. The description will be given at length as the best means of familiarizing the reader with the details, and to present clearly the difficulties which must sometimes be encountered in this operation.

CASE XXXIX.—Miss W., aged 28, of Bridgewater, Vt., was admittted to the Woman's Hospital, May 21, 1876, with the following history:—

Puberty was established at the age of 13; the menstrual flow lasted four days, and there was pain during the first day. She continued in good health until some eighteen months previous, when the pain became gradually greater, and lasted throughout the flow. The flow was increased somewhat in quantity, but its duration remained unchanged.

About eleven months previous to her admission she began to appreciate a feeling of weight in the abdomen whenever she suddenly changed her position in bed. During the autumn of 1875 she noticed an increase in size, and in January last she detected, for the first time, a distinct mass just above the pubes. This enlargement increased rapidly in size until April last, when she consulted Dr. Rodiman, her physician, who detected a fibrous tumor. After the examination she had a hemorrhage lasting a week, *which was the first and only abnormal loss of blood.* The menstrual flow had continued regular as to time, and had *never lasted over four days.* The increase in quantity would not have been noticed if her attention had not been directed to it by her mother, who informed her that she used more napkins than had been her habit when at her age. Her physician administered the fluid extract of ergot, in drachm doses, three times a day, with the effect of arresting the hemorrhage, but the record of her case does not state how long its use was continued.

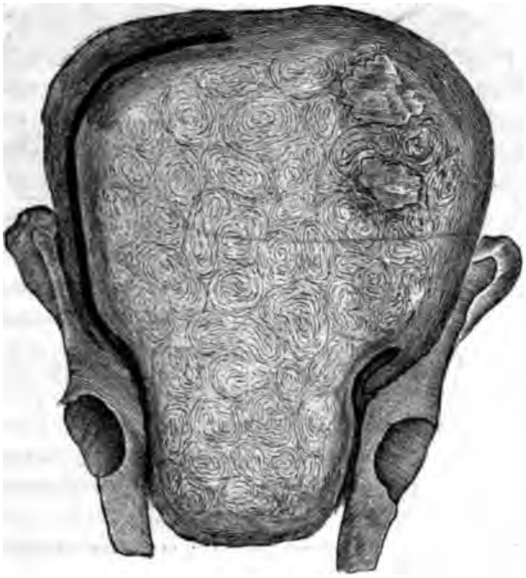
At my first examination, I found the abdomen filled with a tumor extending above the umbilicus, with its lateral diameter the greatest. The vaginal outlet was small, as well as the vagina itself. The uterus was reached high up in the pelvis, and, as in the early stage of labor, the cervix had disappeared, the os was dilated, its edges were thin, and the tumor presented. The finger could be readily introduced within the uterine cavity, and the lower attachment of the tumor was felt just within the posterior lip, a little to the left side, with a broad base, increasing rapidly in width from below upward. The uterine probe was introduced within the cavity nearly eight inches, but in consequence of the great curve of the canal, running up posteriorly and to the left, it was not certain that the fundus had been reached.

May 25, at 12 M., one-half drachm of the fluid extract of ergot was administered, with the effect of exciting uterine contraction within twenty minutes. This dose was repeated in the evening, and three times on the 26th inst., with the effect of causing no disturbance of the stomach, but frequent uterine contractions. May 27, 9 A.M.—The ergot was omitted, and morphine administered to lessen the severity of the uterine pains; this was repeated at 3 and at 9 P.M. Although the pains had been frequent and severe at times, she had continued to go to her meals and to be about her room until bedtime of the 27th inst. She remained in bed during the 28th inst., as the tumor was advancing into the vagina, and the ergot was again administered in sufficient doses to keep up a moderate degree of uterine contraction. At 9 P.M., May 28, I made an examination, as Dr. Anway, the house surgeon, thought he detected some odor. I found the vagina about half filled by the tumor, the os well dilated, and there was no evidence of decomposition. The patient complained of being tired, but was cheerful, and I felt that the case was progressing favorably. I made no change in the treatment but to discontinue the ergot, and found, on inquiry, that the vaginal injections had been given regularly. May 29, she was kept quiet in bed, and somewhat under the influence of morphine, as she was beginning to feel exhausted from the uterine contractions. May 30, in the morning, the odor was marked for the first time, and at 2 o'clock I commenced the removal of the tumor, after the patient had been placed under the influence of ether.

I found the tumor now filling up the whole pelvic canal, and was already breaking down in the portion presenting. Its shape was not unlike that of the cork of a champagne bottle, the compressed portion being in the pelvis (see Fig. 99). I first attempted, but failed, to pass a cord around the mass by means of Gouch's canula. To this I wished to make a slip-knot, to be used in making traction and to steady the mass as it was being removed.

The operation was proceeded with by the removal of the mass from the vagina, piece by piece, with the scissors. I would advance my index finger of the left hand as high up behind the mass as I could, and, while protecting the soft parts, draw down, with a double hook, some portion of the tumor into view. Although the uterus contracted promptly from the beginning of the operation, and firmly compressed the tumor, it did not advance into the vagina as is usually the case. When I had reached the plane of the superior strait, and the cervix was not brought into view, I was puzzled as to the proper course to pursue. I profited, however, by past experience in realizing that the danger to the patient was less in completing the operation than in leaving a portion of the tumor behind to break down in a few hours, and likely to cause blood poisoning. I continued to advance through the centre of the tumor until what remained was almost beyond reach of my instruments. It became then necessary to introduce my hand within the vagina, and, in doing so, the perineum was partially lacerated. The advance was now very tedious, as the tumor had been broken down in shreds, and neither the tenaculum nor forceps could grasp but a small portion at a time. The condition of the patient began to indicate exhaustion, and the administration of brandy was commenced by hypodermic injections. The uterus still continued to contract, and had been reduced much in depth, but the lateral diameter was increased, as shown in Fig. 100. I now realized how the expulsive power of the uterus had been lost, and why the tumor had not continued to advance into the pelvis. Before the operation the os had been dilated to the fullest extent of the pelvic canal, and as the tumor came down, being larger above, the cervix had been crowded off laterally on to the brim of the pelvis. This difficulty was increased as I had advanced through the centre of the tumor, for the expulsive power of the uterus being lost on the pelvic brim, could only add to the lateral diameter.

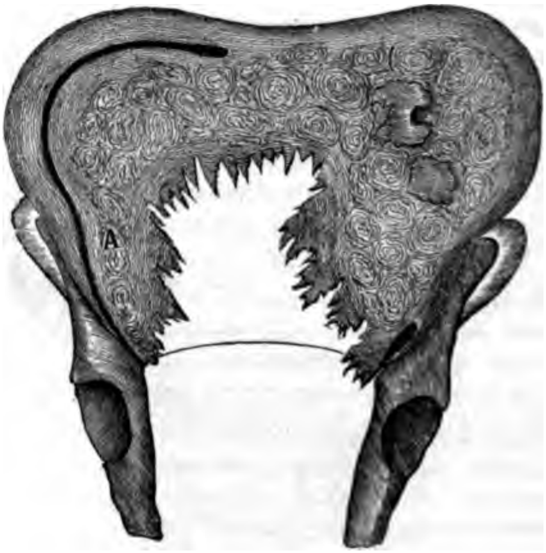
Fig. 99.



Fibrous tumor, projecting in the vagina.

I placed the patient on the left side and introduced the largest size Sims's speculum. The appearance presented by the dilated vagina, and the excavation which had been made into the tumor, was indeed formidable. By means of a large hook, I drew forward the lower edge of the tumor, on the right side, at *A*, Fig. 100, until I brought into view a portion of the surface which projected into the uterine canal. This I seized with another hook, and being the outside of the tumor, and covered with the lining membrane of the canal, was firmer. I was soon able to advance several inches beyond, and, while steady traction was made by Prof. Howard, of Baltimore, who was then assisting me, I was able to remove with the scissors a large mass which had lodged on the brim of the pelvis. The uterus began

Fig. 100.



Fibrous tumor, partially removed (uterus expanding laterally).

now to change rapidly in shape, and the whole circumference of the os was brought into view. By contraction of the uterus the remains of the tumor were forced into the vagina as fast as the mass within reach could be removed. At length the attachment was reached, and was found to have been reduced to a pedicle not larger in size than the index finger. The uterine cavity was yet sufficiently dilated to admit of partial inversion by traction, and the pedicle, formed at the lowest point of attachment, just within the anterior lip, to the left side, was divided in view at the labia. The inverted portion was returned without difficulty, and by the use of Sims's speculum the whole cavity was brought into view. By this means it was demonstrated that there had been no enucleation of any portion of the tumor, and that the whole lining membrane of the cavity was intact, except at the point where the pedicle had been divided. By contraction the tumor had been displaced from the uterine tissue, and as this closed in behind the mass its cavity became lessened until the extent of attachment, which had existed at the beginning, became gradually narrowed to but little more than the outer covering of the tumor, which then formed the pedicle.

The cervix was found very much discolored, and had already begun to slough, in consequence of the continued pressure which the tumor had produced on the brim of the pelvis. The patient was placed on the back, with a bed-pan under her, and, by means of two of Davidson's syringes, a large quantity of hot water was thrown into the uterine cavity, with the effect of causing rapid contraction. She was again placed on the side, and the speculum introduced. The uterine cavity had now been reduced to the depth of about five inches, but as an additional precaution Churchill's tincture of iodine was applied to the cavity and to the blackened surface of the cervix, in order to induce still farther contraction. The patient was then placed in bed in a much better condition than she had been at one stage of the operation, when her pulse indicated an approaching collapse. About ten drachms of brandy were, from time to time, administered in small quantities, by means of the hypodermic syringe. Without its judicious use by my assistant surgeon, Dr. George T. Harrison, and Dr. Anway, the house surgeon, I believe she would have sank before the operation could have been completed.

The operation occupied two hours and a half, and the tumor, as removed, weighed eight pounds, without estimating the loss in the contents of several small cysts which were ruptured. The loss of blood throughout the operation was small in quantity, and confined almost entirely to a small vessel ruptured in the perineum. Two dense fibroids, one as large as a hen's egg, were turned out from the mass (Fig. 100), and were different in character from the tissue surrounding them. They had not yet undergone calcareous degeneration, but had evidently been subjected to great compression, and were so hard that it was difficult to cut into them.

An hour after the operation the pulse became weaker and rose to 175 per minute. She continued to sink rapidly, soon became unconscious, and died nine hours and a half after the operation. She had been sweating profusely during the operation, and continued to do so until her death.

As one of the depressing influences in her case, it should be stated that, while she submitted cheerfully to any treatment, she had already become impressed with the belief that she would die. Her last act, I understand, before taking the ether, was to designate the clergyman whom she wished to conduct her funeral. She certainly was more apprehensive of the result of the operation than I was.

I would refer briefly to some features in the history of this case, which are rarely met with, but which should not fail of recognition when they do occur. That there should have been so little increase in the menstrual flow from the growth of such a tumor is an unusual circumstance. From this fact, and in consequence of the patient being in such a perfect state of health, the shock of the operation was greater than it would have been under ordinary circumstances. It is probable that a point had already been reached in the progress of the case when the uterus would have, in a few days, forced the tumor into the vagina. It is also likely that its course would have been as rapid without the aid of the ergot, and the same steps of the operation would then have been as imperative. In a like case, with the general health unimpaired, and with the tumor so large above, I should, in the future, bring about a more GRADUAL dilatation, if it be possible to control the action of the uterus. By this course a degree of tolerance may be established, and the shock of the operation lessened. In proportion to the action of the uterus must its own supply of blood be lessened, and that to the tumor cut off, thus increasing the danger of blood poisoning from sloughing of the parts most subjected to pressure. In consequence of the unusual shape of this tumor the cervix was forced back from the brim of the pelvis, and from continued pressure it had already begun to slough some hours before the portion of the tumor presenting in the vagina gave any indication of breaking down. On the morning of the operation there were symptoms of blood poisoning detected, which impaired the patient's powers of resistance to the shock of an operation unusually prolonged by the difficulties in its execution. Yet, in the light of past experience, the progress of the case was carefully watched, and the time of the operation well chosen. Under ordinary circumstances it is advisable to DILATE RAPIDLY and TO DELAY THE OPERATION UNTIL THE TUMOR BEGINS TO BREAK DOWN. We thus insure the greatest amount of dilatation to be gained, and the advantage of having a large portion of the tumor already in the vagina before commencing the operation.

In concluding the clinical portion of this subject I will present a case similar to the preceding one, but in which the operation was delayed too long. I had previously seen the case in consultation with Dr. S. Whitall, of this city, and finding the vagina already occupied by a portion of the tumor, I urged an operation without delay. The patient had been flowing almost continuously for weeks, and, in her reluctance to leaving home, she delayed going to the Woman's Hospital, hoping that the flow would stop of itself when she should be in better condition. After her admission the operation had to be delayed some two weeks more, as she was in a state of such extreme prostration that even a thorough examination of her case could not be attempted. During this interval the flow was checked, and every means was resorted to to improve her general health.

The following history of her case is taken from the hospital records.

CASE XL.—Mrs. L., aged 28, the mother of one child, was admitted to Dr. Emmet's service March 26, 1878.

She had been previously a patient in the hospital and under Dr.

care from Sept. 28 to Dec. 21, 1874. During this time the had been divided, the covering of the tumor incised, and she en kept steadily under the use of ergot. But at the time of charge there had been no improvement, the uterus was eleven deep; as at the time of her admission, the period still lasted lays, and the loss of blood was excessive. This condition had isted five years.

e her discharge from the hospital, Dec. 1874, she had been large quantities of blood at every period, and required the very frequently, although she had continued the use of the Her appearance was one of extreme anæmia, the skin looked and leathery, she was very much emaciated, and looked ten lder than she really was.

ysical examination showed that the fundus of the uterus reached to the umbilicus, the whole organ being enlarged by a fibrous a portion of which was projecting into the vagina and had the nce of beginning to slough.

was flowing at the time of admission, and was ordered to take cid and cinnamon water, which she did with good effect. Extra c., ordered.

1 7. Began giving thirty minims of the fluid extract of ergot by rmic injection.

1 9. The ergot had but little or no effect. The uterine contrac- king place about half an hour after the ergot had been given, n after continuing about five minutes they would cease.

morning and also at noon six grains of ergotine were given it slight effect. The patient was etherized at 2 P. M. The was then passed up eight inches to the fundus, along the ante- ll, showing that the attachment of the tumor was to the poste- ll. The os was sufficiently dilated to allow of the escape of n of the tumor, about four inches in diameter.

Emmet began the operation by steady traction upon the pre- portion, while an assistant made pressure on the fundus above. large portion had been drawn down into the vagina it was cut a pair of scissors; another portion was then seized and brought until at length the whole was removed after a continuous labor e hours.

ng the operation Dr. Emmet was careful to make traction on that portion only which projected into the canal. He thus far as possible from the attached portion, so that when the me for its expulsion the uterus would follow it up closely, and event hemorrhage.

ral times during the operation the uterus failed to keep up a ous contraction so that some blood was lost.

water was several times injected into the cavity of the uterus, e effect of causing instantaneous contraction, and temporarily g the bleeding. After the whole tumor, as it was supposed, en removed, an injection was given to wash out the canal. ect was again to bring on marked contractions, causing a piece of the tumor as large as an orange to be forced from its bed, and presented at the os. This was removed with a tenaculum, and the uterus at once contracted to about five inches in depth, so that the fundus could just be reached with the finger. The lining membrane of the canal was found smooth, and when the patient was placed on the side, with a speculum in the usual position, the interior of the uterus was fully exposed by placing another speculum within the cavity, and under the arch of the pubes.

The interior of the uterus was thoroughly painted with Churchill's tincture of iodine. A strip of cotton saturated with glycerine was left in the canal, projecting from the os, and the patient was then put to bed with vessels of hot water about her. She had become very much prostrated from shock, and a drachm of brandy was given hypodermically before the operation was completed.

April 10. Passed rather a comfortable night but vomited occasionally, and when she did so a thin watery discharge would escape from the vagina. At 9 A. M. the pulse was 120, the number of respirations 32, and the temperature 101¾° in the mouth. 2 P. M., P. 148, T. 100¼°. Thirty minims of the liq. opii comp. were given by the rectum, as she was unable to sleep. 7 P. M., P. 140, R. 32, T. 102¼°. The tampon was removed and a hot water vaginal and uterine injection administered. 9 P. M., P. 140, T. 102¼°. The liq. opii comp. was repeated by the rectum. During the day, brandy had been administered regularly by the mouth. At midnight she began to sink, and brandy was given hypodermically. The same was repeated at 4 A. M. Afterwards the spts. am. aromat. was administered by the same method, and the inhalation of the nitrite of amyl resorted to. She gradually sank and died at 7.30 A. M.

Afternoon the post-mortem examination was made. The uterus was removed and measured eight inches in length by four inches wide. On laying open the canal the tissues were found pale, but the lining membrane was covered with a dark bloody secretion, in appearance not unlike that found in a uterus after a recent labor. At no point were the walls of the uterus less than a quarter of an inch thick. A small portion of the tumor, about an inch in diameter, and but slightly adherent, was found in the right horn of the uterus. There was also a small fragment still adherent on the left side near the internal os, but otherwise the interior surface was smooth, and the tumor had been entirely removed.

From the flabby appearance of the uterus it was evident that it had become relaxed, and increased somewhat in size after the operation. The portion of tumor found in the right cornu of the uterus was an off-shoot which had been cut across while still buried in the tissues, but became nearly detached by the last uterine contractions. The other portion near the internal os simply indicated where the last attachment of pedicle to the tumor had been cut across.

If we had no other evidence, the appearance of the uterus in this case would have been sufficient to demonstrate fully that such a tumor can be removed from the tissues of the uterus, by the method described, without injury to the organ. Although this poor woman died, the operation in her case was but a forlorn hope after the great loss of time. The result would have been very different had she possessed even a moderate degree of strength to aid in bringing about a reaction. The operation itself was a complete success in demonstrating the principle which could be applied in other cases.

I have removed by traction at least five or six tumors larger than the one in this case, and a number of smaller ones, and but two deaths have occurred. That we may learn as much from the failures as from the successes, I have reported at the greater length these two cases in which death occurred.

When we can make traction, it matters little how thin the outer wall of the uterus may be, provided we are able to excite the muscular tissue to contraction, since the space will be closed up as rapidly as the mass is withdrawn. This will surely be the case when we have a single tumor, especially if it is situated near the fundus or even in the lateral wall, and if it is not so large as to have replaced the greater portion of the true uterine tissue. There is certainly a limit to the procedure, but so far as my personal experience warrants an opinion, it is safer than enucleation, and is applicable to every case where a prudent operator would feel justified in attempting enucleation. I deprecate any effort to enucleate such a tumor, because we cannot know how far the uterine tissue may have become involved. Should the uterine wall have become too thin to contract properly, death from hemorrhage would occur before the operation could be completed. Where muscular action is not excited sufficiently, or to so limited an extent as to leave a large cavity, as is frequently the case after a tumor has been enucleated, the danger is equally great of death from blood-poisoning. The question of enucleation for small fibroids is not referred to here, since the circumstances are entirely different.

I recommend as a principle of practice to delay all surgical interference as long as possible. But as soon as the tumor presents at the os, and this begins to dilate, we then have proof that a reasonable amount of uterine muscular tissue remains to aid us. It then becomes a question as to the time and mode of administering ergot. As soon as the vagina is occupied by a portion of the tumor, the operation for its removal cannot be long delayed, for, as a rule, it is then a matter of but a few hours before blood-poisoning may supervene.

Whenever the operation has been once commenced, there is but one course to follow, namely, to remove the entire tumor, as this is attended with the least evil and risk to the patient. Whenever the tumor can be forced out by uterine contraction as rapidly as it can be removed at the vaginal outlet, the operation will be attended with but little risk to life. In my experience, there has never been any greater disturbance from this procedure than there is in any ordinary case of instrument labor, provided the tumor has been brought down to a pedicle and then divided. The purpose is at first to excite uterine contraction by drawing on the tumor, and this effect is maintained as the mass is removed piece by piece from the vagina. So that from the commencement of the operation until the tumor has become pedunculated, the process simulates a perfectly natural one, and we have been but imitating nature. As there is no fear from hemorrhage, since the supply of blood is cut off as soon as the uterus begins to contract, our best means for removing the tumor is by a pair of blunt-pointed scissors, curved somewhat on the flat side. The écraseur, I have found, is not well fitted for the purpose, as it does not excite the uterus to the proper amount of contraction, nor can we remove the mass with it as rapidly as with scissors. The operation is best begun by passing a slip-knot high up around the mass, which is to be held by an assistant, to steady the uterus and for making traction. After having removed the portion which first filled the vagina, it is best to follow afterwards, so far as possible, the course of the uterine canal. The advantage is twofold: first, the portion projecting into the canal, with its capsule-like covering, is firmer; and, second, by removing the tumor at the most distant point from where the pedicle is to be formed, the line of attachment becomes narrowed as the uterine cavity can be lessened in size.

A few words in relation to the after-treatment. When the tumor has been removed, with all shreds or loose portions within reach, it is important to wash out the cavity thoroughly. It is best to use very hot water, for it is a prompt exciter of uterine action, and by prolonging the injection we can thoroughly empty all the capillaries within reach of its direct influence. After the injection we possess no better means of increasing and of maintaining the contraction than in the free application of Churchill's strong tincture of iodine. Should there be any oozing of blood after the hot-water injection, the application of iodine is certain to arrest it, unless there exists some impediment to the proper contraction of the uterus. It is a most valuable antiseptic, and I am confident that we possess no better means as a prophylactic against blood-poisoning, when used as I have employed it.

Under no circumstance is it a safe practice to introduce the persulphate of iron into a cavity to arrest hemorrhage. It possesses in itself no astringent properties, and only coagulates a mass of blood, which then acts mechanically. The blood is so altered in character by contact with the persulphate that it undergoes decomposition within a few hours. From this source the patient frequently becomes blood-poisoned before any septic element has been generated elsewhere. It acts as a local irritant, and it is impossible to get rid of it until removed by suppuration. After injecting the iodine I sometimes pack in a little cotton saturated with glycerine. If more than this is needed, it is better to use damp cotton which has been saturated with a strong solution of alum, and tampon the vagina with the same material. On the second day I carefully remove the cotton, and if there is no bleeding after washing out the cavity, I dispense with all dressings. It is necessary to devote the utmost care to cleanliness by frequent injections of warm water. To these injections may be added a little brewer's yeast as a stimulant and disinfectant, or carbolic acid, if there is any tissue undergoing decomposition, and I keep the patient in bed until all discharge ceases from the uterine canal.

Dr. T. G. Thomas[1] is the most recent advocate for the removal of fibrous growths by enucleation, and his practice has not been confined to fibroids alone, but he has also enucleated tumors of large size from the uterine walls.

With the aid of traction and an instrument which he has devised for the purpose, he separates the tumor from its attachments in the following manner:—

"The object of this paper is to offer a plan which experience leads me to regard as superior to any of these, and which I believe will supersede them with all who are willing to give it a fair trial. This method consists in seizing the tumor at its most dependent and accessible point with strong vulsellum forceps, passing up along its sides the spoon-saw or serrated scoop depicted in Fig. 101, and by a gentle, pendulum motion from side to side sawing through the attachments of the tumor and freeing it entirely from its connections with the uterus.

"THE SPOON-SAW OR SERRATED SCOOP [Fig. 101].—This instrument consists of a steel spoon with a strong handle, twelve or thirteen inches long. The spoon itself is slightly convex upon its outer, and concave upon its inner surface, while its borders are serrated. The saw teeth are blunt and not slanted in either direction, but perpendicular. The outer convex surface protects the uterine wall entirely, while the inner and concave causes the instrument to hug the tumor and run along its surface as it cuts its way laterally and upwards.

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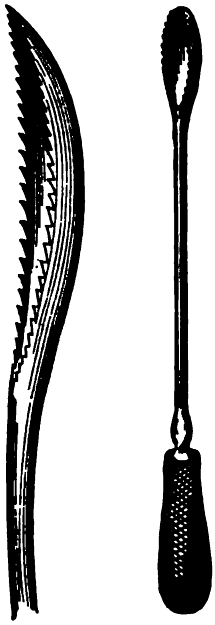
[1] A New Method of Removing Interstitial and Submucous Fibroids of the Uterus. Archives of Medicine, N. Y., Feb. 1879.

"The advantages which experience teaches me attach to this instrument are the following: 1st, the attachments of the tumor are separated by a saw, which greatly limits hemorrhage; 2d, the shape of the spoon, convex without and concave within, causes it to follow of itself the contour of the tumor unless this be very lobulated, and protect the enveloping uterine tissues from injury; 3d, the highest points of attachment of the tumor are as readily reached as the lowest, the freed growth descending under traction as the saw severs its adhesions in successive sweeps around it; 4th, the saw action gives to the process of separation, whether the growth be interstitial or submucous, sessile or pediculated, rapidity and certainty; and 5th and last, though by no means least, the nature of the spoon-saw secures separation of a growth at the highest point of its attachment, leaving no peduncle to decompose."

Fig. 101.



Thomas's spoon-saw or serrated scoop.

Dr. Thomas has fully proved the value of this instrument in his hands. His results have been remarkable, and notwithstanding my prejudices are uncompromising against the usual method of enucleation, I can appreciate the great advantages to be derived from the use of this scoop under certain conditions. It is my impression that the instrument would be found most useful in the removal of small growths; and for the more severe form of tumors, when the growth had been for a time at a stand-still, so that a line of demarcation, as it were, would exist between the tumor and uterine tissue. On the other hand, where the tumor has been of rapid growth, so that its tissues would differ little in density from those of the uterus, its use would offer no advantage over the scissors, when employed within reach of the finger.

Where the uterine walls were thin, I would regard it as a dangerous instrument for use even in the hands of an expert. If properly handled it possesses the advantage of making a clean delivery, as it were, and its use consequently lessens the danger from blood-poisoning,—a common sequence of enucleation by the usual method. The after-treatment would be essentially the same as that already given, and particularly in regard to the frequent use of vaginal injections, to which a certain amount of carbolic acid had been added.

The ovaries have been removed, as a comparatively recent mode of practice, with the view of controlling the hemorrhage and to arrest the growth of these tumors. Dr. Wm. Goodell,[1] of Philadelphia, advocates the removal of both ovaries through the vagina, if possible, otherwise by abdominal section, in cases which are not amenable to treatment by the ordinary methods. The operation for the purpose was first performed by abdominal section, in 1876 by Dr. Trenholme, of Montreal, in one case ; then by Prof. Hegar, of Freiburg, in two cases ; next by Prof. Nussbaum, of Munich, in one case ; and lastly, in 1877, by Dr. Goodell, in one case. All of these five cases were successful, the symptoms for which the operations were undertaken being wholly relieved, and the fibroids themselves shrunk away, as they sometimes naturally do after the menopause. The idea is that, as the sexual and periodic congestions of the womb feed the fibroids, render them painful, and increase the hemorrhage from them, these symptoms and the fibroids themselves ought to disappear when the ovarian influence which causes the congestion is destroyed.

Prof. Hegar (Freiburg) read a paper on "Female Castration" before the German Gynæcological Society, held at Baden-Baden September, 1879. An abstract of this paper is given in the Am. Journ. of Obstetrics, etc., N. Y., January, 1880. The report contains the result of forty-two castrations, which are classed under several heads.

In regard to the operation for the arrest of these growths, we find the following : "The second group comprises the fibroids, for which castration was performed twelve times. The tumors were not large, and never extended far above the umbilicus. Only once I operated in a case of large interligamentous tumor, inasmuch as extirpation did not appear feasible ; the ovaries could be plainly felt under the anterior abdominal wall, and the desperate condition of the patient justified any measure which promised relief. As a rule, I look upon castration as a doubtful measure in very large fibroids. However, future experience will be necessary to settle the question definitely."

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[1] A Case of Spaying for Fibroid Tumor of the Womb. Am. Journ. Med. Sci., July, 1878.

[illegible] occurred: the patient lived in very imp
[illegible] and the hardest kind of labor. The tu
[illegible] fluctuating, and death finally occurr
[illegible] The autopsy showed an enorm
[illegible] which the extremely dilated lymphatic sp
[illegible] serum."

[illegible] views must be accepted as those of the late
[illegible] and no other operator has placed on
[illegible]

CHAPTER XXX.

DISEASES OF THE EXTERNAL ORGANS OF GENERATION, CERVIX, AND UTERINE CANAL.

Elephantiasis and hypertrophy of labia and clitoris—Fibrous and fatty tumors—Oozing tumor—Labial cysts—Vaginismus—Vaginitis—Disease of the cervix and uterine canal.

THESE are chiefly cancerous growths, from the mucous membrane and deeper tissues; interstitial growths; and diseases of the mucous membrane. Having already treated of cancerous growths, so far as anything could be advanced of special and practical interest, we need not refer again to them.

We shall first treat of elephantiasis and simple enlargement of the labia, nymphæ, and clitoris, fibrous and fatty tumors, cystic growths, and oozing tumor.

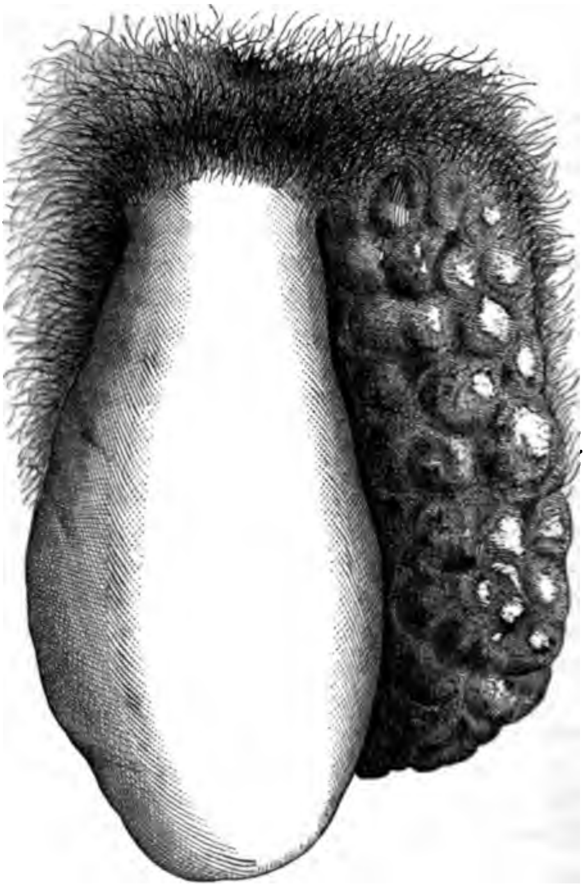
Elephantiasis of the labia is very rare in this country. In the East, where it is quite common, much doubt yet exists as to its exciting cause. The surface is rough, hard, and dry, and has little resemblance to healthy skin. Virchow regarded the disease as originating in the lymphatic glands, the connective tissue becoming hypertrophied and papillæ springing up on the surface. The rapidity of growth is not uniform in all parts of the mass, and that which develops first projects and gives an irregular appearance to the surface.

I have seen but one instance of this disease, or rather, I should say, but one in which there was a near approach to such a condition, so far as I could judge.

CASE XLI.—A woman from the western part of New York, consulted me in April, 1866, for a tumor about the vulva. She was twenty-five years of age, had been two years married, and was sterile. She stated that when between sixteen and seventeen years old she noticed a swelling first in the left labium, which gradually increased in size. It occasionally felt sore, but never really painful. When first married she suffered a great deal at every sexual intercourse, but she ultimately learned that if she turned the loose tumor up towards her stomach no pain accompanied this act.

The left labium and clitoris were enlarged to about the size represhown in the wood-cut, Fig. 102, which is from a rough sketch made by me at the time. The right labium and nympha were in a healthy condition, but the nympha on the left side had disappeared. The diseased labium was rough, hard, and like a piece of sole leather, while the enlarged clitoris was smooth, and not unlike a fibro-cystic polypus in density. The uterus was enlarged, retroverted, and fixed

Fig. 102.



Elephantiasis of the labium and hypertrophied clitoris.

from old cellular inflammation. The cervix was just within the vulva, and a fair depth to the vagina had been gained by stretching the posterior cul-de-sac. The position of the uterus was doubtless the cause of her sterility. She had grown exceedingly nervous since marriage, was losing flesh, and had a cough, but no disease of the air passages [illegible]ted, except an old follicular inflammation in the

[illegible]peration, and she returned home to consult her husband; he was, however, unwilling to have her leave home, and nothing was done. When about writing this chapter, eleven years later, I wrote to her physician for her after-history, and learned directly from the woman herself that there had been little increase in size in the growth, and that her general health still remained impaired.

General hypertrophy of the labia and nymphæ occurs from inflammation, as the most common cause. I have seen the nymphæ enormously enlarged in several instances, and occasionally so much so as to cause irritation of the bladder, by dragging on the urethra. The nymphæ are easily removed with scissors, and if any unusual bleeding should occur it can be controlled by a compress of damp cotton over the bleeding surface, kept in place by a sufficiently large glass vaginal plug. When this instrument is used, the compresses need not be disturbed until loosened by suppuration. The catheter can be introduced without difficulty while the plug is in place, and at the same time the plug itself will continue to exert pressure under the symphysis, on the branch from the internal pudic artery which supplies the nymphæ. I have seen but a single instance of simple hypertrophy of the labia to an extent demanding surgical interference.

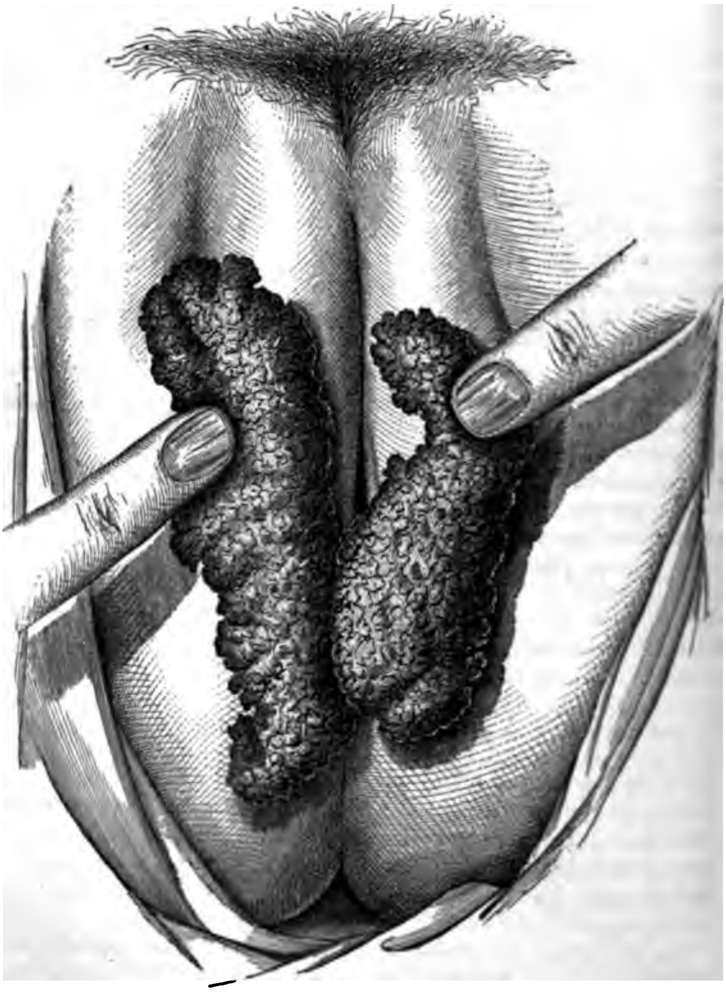
CASE XLII.—The woman was about 47 years of age, and had given birth to several children. I operated, removing both labia, one of which weighed three, and the other two, pounds. The edges were brought together by interrupted silver sutures, and union followed by first intention. There seemed to have been no apparent local cause for this growth, and I regarded it simply as an instance of excess of nutrition. There was no return of the disease.

Fibrous and fatty tumors sometimes develop in the labia to an immense size, and by dragging on the soft parts they become pedunculated, or rather the tissues forming their attachment become stretched out to a broad but thin base.

CASE XLIII.—About eight years ago I was consulted by a rather stout and middle-aged woman, who had a growth on the left labium, which she carried in a bag attached to her waist. The tumor was of many years' growth, but she could not state with any certainty the exact time. It was a pure lipoma, or fatty tumor, between six and seven inches long, oval in shape, and flattened to about four inches in thickness. The base was a broad one, but very thin, and had been so stretched that the growth reached nearly to the knee. As she lay on the back, with the knees and thighs flexed, the tumor rested between her feet. I was examining the attachment with great interest, with a view to an operation for its removal, when suddenly she accosted me in a tone calling for sympathy, saying, "And is it cancer, Doctor?" "Oh, no; you may rest assured that it is not," was my answer. "I am much obliged to you, Doctor; that is just what I [illegible] now," and down went the petticoats without further delay. [illegible] impress her with the fact that I had been hasty, and after [illegible] cancer might appear at her time of life, but without any [illegible] she would not even allow me another examination, that I [illegible] make a sketch of the growth.

Oozing Tumor of the Labia.—This is an irregular papillary, or cauliflower-like growth springing from one or both labia, the prominent feature being a profuse acrid and watery discharge, which is exceedingly offensive. It is supposed to be due to a want of cleanli-

Fig. 103.



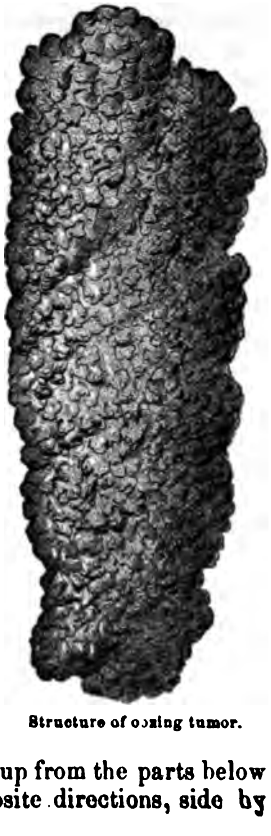
Oozing tumor of the labia.

ness, and may occur at any age. Those, however, who have described the disease state it to be one of middle life, most common with the fat, and with those who have borne children. I have had but two cases under observation. One was a young girl, whose history I will detail, and the other was a young woman, about twenty-three, who had never been pregnant. In both instances I amputated the labia.

CASE XLIV.—M. E. S., aged 16, was admitted to the Woman's Hospital, from Oswego Co., N. Y., Jan. 18, 1876. Menstruated first at twelve; became regular, and flow lasted four days; but her general health was never very good. Three months previous to admission she noticed something growing about the vulva. This growth had rapidly increased, being accompanied by a very disagreeable discharge; it bled readily, but was free from pain.

I found the labia entirely covered by a growth, with the exception of a small portion at the upper part, which was very much swollen. This growth resembled cauliflower excrescence somewhat, and extended a little beyond the anus. It was about an inch and a half in width at the widest part, and an inch in depth (see Fig. 104). On rolling out the parts it was found to extend within but a short distance upon the mucous membrane. Under the cut edges of the mass were found several detached growths, springing from the skin. The growth could be separated by the fingers into distinct lobes, each springing from a separate pedicle, but branching out so as to present on the surface a continuous growth, like the fastigiate cymes of certain umbelliferous plants, and filling the whole space between the thighs. On a careful examination separate papillæ could be distinguished, about one-third of an inch in length, and all closely packed together. An attempt has been made in Fig. 104 to show the structure of this growth. Her general condition was poor, and she was found to be extremely anæmic. The odor was excessively fetid, annoying all about her in the ward. Much time was spent after her admission in keeping the parts as clean as possible, by frequent washings with a solution of carbolic acid in water.

Fig. 104.



Structure of oozing tumor.

Jan. 25. She was etherized for the purpose of being operated on. Fearing excessive hemorrhage, I took a section of silver wire, and attaching a straight needle directly to each end of the wire, the tumor being lifted up from the parts below by an assistant, I passed each needle in opposite directions, side by side, along the same tract, making a shoemaker's stitch. This was done at intervals of one inch. The left labium was then rapidly cut away, with a pair of scissors, well into the healthy tissue. The sutures controlled the bleeding to a great extent, but it was necessary to tie several arteries, and as this involved the removal of several of the sutures to admit of the ligatures being tied, some hemorrhage followed. This determined me to remove the other labium in a different manner. Beginning from above, I cut through, with a knife, about one-third of the part, then rapidly introduced the sutures so as to catch up the skin only, on opposite sides. These were then crossed by an assistant, and held down tight enough to bring the sides in contact. This plan was followed until I had removed the whole. Yet, notwithstanding the precaution, and the rapidity with which the operation was advanced, the loss of blood was very great. Contrary to the rule, a number of arteries had to be tied, and the oozing was troublesome. Eleven sutures were placed in the left, and sixteen in the right, labium. These sutures were bent over so as to lie flat on the skin, and under their edges was placed a narrow strip of greased linen. A linen compress was placed between the labia, so as to keep up pressure on each side, and over all a T bandage. The several detached points of growth were removed with scissors, and their base touched with the galvanic cautery, which at once stopped all bleeding.

There was nothing in the progress of the case to note until Feb. 1st, when the sutures were removed. There had been no pain, and but little discharge. It was found that the wound itself had healed throughout by first intention, but the course of several of the sutures was inflamed, as if the sutures had been disturbed. After washing off the surface, by squeezing upon it tepid water from a sponge, a daily dressing was made of the balsam of Peru spread on linen.

Feb. 10. Nearly all the surface had healed, except at two or three points, where the granulations were large, and these were touched with nitrate of silver. I then directed the parts to be kept dry by dusting oxide of zinc over them, and to dispense with all bandages, which were keeping the parts too warm.

March 1. The tract of two sutures had not yet healed, but after making two applications to them of strong carbolic acid, they closed in a few days.

From the date of her admission the greatest care was directed towards improving her general state, for she was very anæmic, and her appearance improved greatly after taking an old preparation of the tincture of the chloride of iron. The uterus was retroverted, and there was quite a vaginal discharge. The uterus was put in place, and a pessary fitted. Vaginal injections of warm water were freely used, some chloride of ammonium being added to each.

May 12. She was discharged cured, and a no less remarkable feature in her case was the rapidity with which all traces of the operation were disappearing.

Labial Cysts.—Mucous glands in a state of cystic degeneration, and dermoid cysts are sometimes found in the labia. The dermoid cysts are exceedingly rare. Those of the labial glands are formed by degeneration of the glands of Bartholini (also called glands of Duverney), which are situated on each side of the entrance to the vagina. These cysts may form either in the glands or in their excretory ducts, and are more frequently found on the left side. I have had six cases in private practice and three in the Woman's Hospital, of which eight were on the left and one on the right side. All the women were under thirty years of age, and the cysts were found among all classes, unmarried, sterile, and fruitful. They develop very slowly, are free from pain, and give no inconvenience beyond that which comes from their bulk. I have never seen one of these cysts enlarge beyond the size of a hen's egg, although they sometimes reach a much larger size.

Diagnosis.—As a cyst enlarges, it rolls out and exposes the more delicate mucous membrane covering the inner face of the vulva on that side, and its form, when distended with fluid, can be easily defined. These cysts are sometimes oval, and it might be possible, from a hasty examination, to mistake a loosely filled sac for an inguinal hernia. Should the intestines have come down into the labium, and the patient be made to cough while the mass is grasped with the hand, a corresponding impulse would be transmitted. If it is a hernia, it can be easily reduced, and the mass will disappear, which of course could not occur if it were a cyst. Then if it were an irreducible hernia without being strangulated, the gut would always be sufficiently distended by flatus to give a clear sound on percussion. In fact, such a cyst cannot be mistaken for anything else if ordinary care be exercised in the examination.

Treatment.—To bring about adhesive inflammation within the walls of the sac and thus prevent its refilling, or to extirpate the whole cyst, will be the only plans of treatment which can be followed with any certainty of success. Local applications or simply emptying the cyst of its contents will be of no permanent benefit.

After evacuating the fluid, the cyst must be freely laid open, a thorough application of iodine made to its walls, and the cavity packed with oakum, which is to remain until suppuration is established. To insure the healing up from the bottom, the cavity must be frequently washed out by injections, and a pledget of oakum kept inserted to the bottom of the wound to secure thorough drainage. This plan will sometimes succeed, but as the outer wall of the cyst is very thinly covered by tissue, this portion of the labium may slough, and in such a contingency the contraction would afterwards be very considerable.

When the cyst is punctured or extirpated, the parts should be first rolled out as much as possible, that the tumor may become more superficial. In this way we avoid a large plexus of vessels which lies in the labium, which would otherwise be directly in front, and the cicatrix which is to form will then be so far within the vaginal outlet as to be but little exposed to irritation.

For the removal of a cyst of this nature, the patient must be etherized, and placed on the back with the limbs flexed on the abdomen. Then, as the labium is everted by an assistant, the operator catches up the cyst between the thumb and forefinger, so as to put the parts covering the cyst on the stretch. An incision, some two inches long, must be made parallel to the course of the labia, and with great care, down on to the cyst. Then by tearing the tissues with the handle of a scalpel, and by snipping them with a pair of scissors, and by the proper amount of traction, the attempt must be made to remove the cyst entire. It is rare that this can be done, for rupture and the escape of the contents of the cyst will readily take place. But care and a steady hand must be employed until a sufficient portion has been dissected out to serve as a guide for the removal of the whole. Some of these cysts are thus removed without difficulty, while others extend so far within the pelvis that I have doubted their connection with the labial glands. The attachment of the last cyst of this kind which I removed extended to the periosteum on the inner face of the left ramus, and when it had all been removed a most formidable opening was left.

It is highly important that union by the first intention should be gained as far as possible. With this view I introduce deep silver sutures from above downward, so as to bring the soft parts into apposition, if it can be done. When this is not practicable, I endeavor to gain what I can, but then leave always in the lower angle of the wound a little oakum, which must extend to the deepest portion of the wound, to insure the drainage of any accumulation of pus. Frequently all, or at least a large portion, will then heal by the first intention, and the sinus will close soon afterwards.

Vaginismus.—This subject is now presented without any special connection with the preceding, beyond having a common locality, and because it cannot well be classified elsewhere.

It is to be regarded purely as a symptom, denoting reflex irritation, of which the chief expression is an exaggerated sensitiveness about the hymen and vaginal outlet. As the irritation is transmitted through the sympathetic nerves, the effect is experienced at its terminal branches in the erectile tissue distributed about the entrance to the vagina.

It is found only in anæmic and excessively nervous women, and in those who have in some manner overtaxed their nervous systems. Their general condition renders them peculiarly liable to neuralgia, of which the symptom under consideration is but a kindred ailment. The locality is determined as if it were by accident, or by some law of which we are ignorant. It is an exception to find any local exciting cause; occasionally there may be some cicatricial tissue about the perineum or neck of the uterus, or some local inflammation or disease of the vagina, vulva, meatus, urethra, or vesical neck.

Vaginismus, which is the name—although an inaccurate one—given to this condition, was first recognized by Dr. Sims, in 1857, and in his work on Uterine Surgery it is described and treated as a distinct local lesion. My experience does not coincide with his, as I have never failed to find some condition, as a displacement, a limited cellulitis, a fissure in either the rectum or neck of the bladder as the exciting cause. But even when apparently due to a local inflammation, such as a discharge from the uterine canal, it will be found that treatment directed solely to removing this discharge will seldom relieve the vaginismus. By making a most thorough examination we will rarely fail to detect the remains of a cellulitis, between one or the other broad ligament, which obstruct the circulation to a greater or less extent, and cause the discharge. If a cellulitis exists or a displacement or a fissure, such condition must be treated. Frequently all three exist together, and they must all be removed, and some improvement made in the general condition, both morally and physically, before the vaginismus can be permanently cured.

Dr. Sims recommended the entire removal of the hymen with a pair of scissors, and the insertion of one of his vaginal glass plugs until the parts healed. He directed the plug to be removed from time to time, and injections used, as after the operation for opening the vagina. After the parts had healed, the circular cicatrix, made by the previous operation, was freely divided at different points. He then made two incisions, across the course of the muscle, so that they came together, like the upper portion of the letter Y, and were then continued through the perineum as a single incision, until the vaginal outlet had been fully opened. The plug was again used until the parts had healed.

This operation sometimes gives a remarkable degree of relief accompanied by much improvement in the nervous symptoms, but I have found that the difficulty generally returns. In fact, I have never met with a permanent cure unless the exciting cause was sought out and removed. Where the vaginal entrance is unusually small, and the woman has not learned to exercise self-control, I am sometimes obliged to perform the operation, but never under other circumstances.

I generally give ether to ascertain at the beginning the cause of the difficulty. If due to a displacement, I attempt at once to correct it; if I find a fissure in the anus, I operate without delay by moderate dilatation, bringing the parts well into view and completing the operation by drawing a knife through the tract of the ulcer. If I find the remains of cellulitis, and there is nothing urgent, I simply put the vaginal outlet thoroughly on the stretch at the completion of the examination. I direct hot vaginal injections of water to be given night and morning as the only local treatment. The bowels are carefully regulated, and every attention given to improving the general condition. Sun-baths are to be used, more fresh air obtained, and some congenial occupation, involving moderate exercise, must be found to engage the time of the patient. One of the first steps towards her cure will be to get her away, temporarily at least, from the exciting cause of irritation to her nervous system: this is frequently her husband.

There is a certain condition which is almost always accompanied by a moderate cellulitis in one of the broad ligaments rendering the female devoid of all sexual desire. For a time, woman-like, she will submit to marital approaches through a sense of duty, but after a while, by degrees, their suggestion even excites a feeling of disgust. If she continues to submit to what she supposes she is obliged to do, this hyperæsthesia and spasm become finally developed as a protest of the disgust, in the same manner as the gullet closes spontaneously against, and rejects a nauseous draught. If the necessary treatment can be administered by degrees, this condition will disappear without an operation, and the woman will return to her duties as a wife with very different feelings.

When the operation has to be done, I perform it in a manner differing somewhat from that practised by Dr. Sims. The patient is placed on the back with the limbs drawn up; after etherization, a speculum is introduced under the arch of the pubis, so as to bring the posterior wall of the vagina into view. The index finger is inserted within the anus and the sphincter is pressed up against the posterior wall of the vagina. It is then easy to divide with scissors the fibres encircling the vagina on each side, just within the fourchette, and about three-quarters of an inch apart. This does not allow a prolapse of the vaginal wall, as when the perineum is lacerated, but does permit of an equal extent of dilatation of the outlet by the glass plug.

Vaginitis.—Inflammation of the mucous membrane due to venereal diseases will not be treated of, nor will cancerous growths be again considered under this head, but only the effects of cold or injury, and benign growths in the vagina and uterine canal.

Inflammation of the mucous membrane covering the cervix, vagina, and vulva, is a very common result of cold and local injury. Exposure to cold will cause inflammation in the cervical mucous follicles, which may in time subside, or leave the woman liable to relapse. It will often happen that a circumscribed and unsuspected attack of cellulitis has been contracted at the same exposure. Certain changes may afterwards take place in the circulation of the cellular tissue, so that one condition will react on the other, particularly if the exposure to cold or the over-exertion has been excessive.

Repeated attacks of inflammation of the lining membrane of the vagina and that covering the labia may be excited by a similar condition in the cervical canal, and may entirely disappear, but the products of each attack of inflammation will remain within the cervix ready to set up a fresh development. This condition of the cervix is commonly termed chronic inflammation, in regard to which my views have been fully expressed in a previous chapter. I do not believe that such a pathological state can exist. After an attack of inflammation, its products are easily recognized, and chiefly there is manifest such a change in the condition of the bloodvessels as leads to increased secretion. The retention of a portion of this secretion within so confined a space, may in turn react on the mucous follicles and thus keep up a diseased action which would disappear sometimes, as in the vagina, by resolution, if the condition and environment were different.

The same may be true regarding the lining membrane of the Fallopian tubes. When inflammation has been once produced in them by cold or gonorrhœa, it never subsides during the generative life of the ovaries, but leads to sterility and other troubles. This condition of inflammation has been termed salpingitis, and after this mention I will not again refer to it, since we have no means of recognizing its existence or its products until after death.

Many opinions have been advanced as to the cause of inflammation of the vaginal mucous membrane.

It occurs as gonorrhœa, a subject, however, which the scope of this work does not embrace. It doubtless is also produced by exposure, want of cleanliness, and the presence of pediculi, and it is said that certain conditions of the urine, as in diabetes, will keep up the irritation.

But, for our purpose, the condition may be regarded as the direct result of poisoning from some uterine discharge. This discharge frequently does not become irritating until it reaches the vaginal outlet and is exposed to the action of the air. The inflammation is then first established on the vulva, from which it extends to the external organs and within the vagina.

Some women suffer from this malady after any unusual exertion, after sexual intercourse, and after each menstrual period, but it disappears often in a short time, without leaving a trace.

A severe attack will be ushered in by a chill and fever, a feeling of great heat and fulness in the vagina, back-ache, irritation of the bladder and itching, some relief as to the more urgent symptoms following as soon as the discharge becomes established. The disease will then gradually subside, or, as I have known in several instances, the vaginitis, when at its height will suddenly disappear, as by metastasis, on the advent of an attack of cellulitis or peritonitis.

But the cases which we meet with most frequently in practice will not be of so serious a character. Yet few diseases to which women are specially subject, are attended with more continued suffering and annoyance than this one.

The pruritus, or itching, will often be intolerable, and is made worse as soon as the woman becomes warm in bed, and is unable to resist seeking the momentary relief which scratching and tearing her person will afford. Until the disease has run a certain course, nothing apparently relieves it, in some cases, except an anæsthetic.

I have had several cases under my care which gave me much concern on account of the critical nervous condition due to loss of sleep, and the exhaustion from want of nourishment.

A vaginal examination will rarely show a condition sufficient to account for the suffering. There will be found a more profuse cervical discharge than usual, the mucous membrane of the vagina will be of a natural color within the passage, but becoming red and dry as it blends with that covering the outlet, which will always be the more inflamed. But occasionally the whole lining membrane of the passage and external organs will be inflamed. The parts will be thrown into folds, and the papillæ prominent, so as to give a deep red and roughened appearance to the mucous membrane. At first there will be an absence of secretion, and the parts hot and swollen, but at a later stage the secretion of pus may be profuse. The case may be still further complicated by the formation of an abscess in the deeper tissues of the labia. But between the two extremes we will find every shade in the degree of inflammation.

Treatment.—A thorough injection of warm water must be first given, a speculum introduced, and the parts dried. If very much excoriated, the parts can be best dried by applying a piece of soft linen spread out over them. Under ordinary circumstances a soft sponge will answer, but it should never be used for another case. The greatest cleanliness of person and instruments should be observed, for there is no question of the communicability of this poison from one woman to another by means of the discharge. It can be, and is frequently, thus transmitted, through carelessness on the part of the physician or the nurse.

As the patient lies on the side, with the vagina fully exposed by a speculum, a solution of nitrate of silver must be applied within the cervical canal, and over every portion of the vaginal mucous membrane and outlet. A solution of forty grains to the ounce of water is the strength I generally use. For the uterine canal the applicator will have to be employed, but for the vagina and outlet a small sponge probang or a portion of cotton twisted around the end of the swab stick is best. It is the best plan to pour out a small quantity into a shallow vessel, into which the probang may be dipped from time to time, and the solution applied until the whole surface becomes whitened. After this the speculum is withdrawn, the patient on the back, and some cotton packed into the sulcus, below the perineum, to protect the clothing. Then, as an assistant exposes the inner face of the vulva, by pressure of a hand on each side, the same application must be thoroughly made to it. Whenever the inflammation has extended to the parts covered with hair, it may be necessary to shave them.

As soon as the parts have dried they are to be freely covered with zinc ointment or vaseline, and a soft piece of linen, about three inches long, and as wide, must be laid between the labia, and pushed sufficiently within the vagina to be held in place. Afterwards the patient must be put to bed. The application of nitrate of silver will cause but little pain after a few moments; in fact, if it should cause pain this will add nothing to the distress, since it brings relief from the itching. Before bedtime an injection of hot water must be administered, containing a teaspoonful of chloride of ammonium to each pint. Either borax, bicarbonate of soda, or chlorate of potash may be used for the same purpose, although neither is so efficacious. After the injection the ointment must be again freely applied. These injections must be administered two or three times a day, the patient's hips being elevated for the purpose. On the following morning after the injection has been given, a mass of cotton or oakum, thoroughly saturated with glycerine, must be placed in the vagina. To the glycerine should be added a few drops of impure carbolic acid, and the dressing must be smoothly spread out along the length of the vagina, so as to keep the walls of the passage from coming together. After each injection a fresh dressing must be placed within the vagina. Should there be much heat and swelling, a few spoonfuls of alcohol can be added to the injection, which, with the chloride of ammonium, will hasten the evaporation, and by this means lower the temperature. If the case happens to be a mild one, the application of the impure carbolic acid will answer perfectly well. Glycerine is invaluable as a disinfectant, and for relieving capillary congestion through its greed for moisture.

The strength of the nitrate of silver solution must be increased according to the severity of the case, and at some special point it may even be sometimes necessary to resort to the solid stick. These applications frequently have to be repeated in four or five days, if a decided relief has not been gained.

Some severe forms of this disease are relieved by filling the vagina and covering the external parts with a thin paste, or poultice, made of fuller's earth, over which a napkin is to be placed for protection, in the same manner as for an infant. A little glycerine, added to the water with which the fuller's earth is mixed, will prevent its drying rapidly. As it begins to get dry and irritating it is to be removed from the vagina by means of an injection, and that from the labia must be washed off with a jet from the syringe, and not wiped away by a cloth. I suppose that a mud poultice, made from any earth which has been reduced to an impalpable powder, would answer the same purpose. I happened to use fuller's earth, the *Cimolia purpurescens*, from my knowledge of it as an old woman's remedy for "taking the heat out" of an inflamed breast or nipple.

The disinfecting and deodorizing properties of common earth, and its power, when damp, of lowering the temperature of an inflamed surface, have long been known to the surgeon.

Until the patient has been greatly relieved she should remain in the recumbent position, with her hips somewhat elevated.

One of the first steps in the treatment of this condition should be to effect a proper action of the bowels by a prompt saline cathartic. If the bowels have been sluggish a dose of calomel and soda will prove useful in relieving the portal circulation, so that the pelvic vessels may become less charged with blood. The patient should, if necessary, have an anodyne to overcome excessive pain or sleeplessness.

As a local application a small quantity of chloroform may be rubbed into an emulsion, or mixed with simple cold cream spread upon a cloth, and applied between the labia. As an anodyne Dover's powder is preferable, when it can be retained, and to it, at night, three to five grains of quinine may be added.

Should an abscess result from this inflammation, it should be poulticed, and opened as soon as fluctuation can be detected, in order to prevent the burrowing of the pus. The point of puncture should be made well within the vaginal outlet, for the reasons given when describing the operation for removing labial cysts. It will be necessary also to give some attention to the general condition, not only because the patient's strength is always impaired, but because any improvement in it will hasten the healing of the abscess.

Certain Conditions of the Mucous Membrane covering the Cervix and of the Membrane lining the Uterine Canal.—The structure proper of the cervix is dense, and contains but few bloodvessels or nerves in comparison with the other portions of the uterus. But its surface is covered with erectile tissue continued from the vaginal walls, and this is freely supplied with bloodvessels and with nerve fibres from the sympathetic system. It is through the medium of these nerves, that morbid processes in the cervix, by reflex action, may cause a serious impairment of health, and even establish diseases in remote parts of the body. It has been already stated that the sympathetic presides over nutrition through life, and over the organs of generation during the period of their activity.

As a consequence of this close relation, it is evident that the general nutrition must soon suffer if a condition long exists in the generative organs from which morbid reflex irritations can emanate. The presence of cicatricial and dense tissue in the cervix will sooner or later excite this. If the mucous follicles become inflamed, undergo cystic degeneration, and are at length destroyed, phthisis so often results, that the relation of cause and effect cannot be doubted. When the character of the mucous membrane covering the cervix has been destroyed, either by inflammation or by the continued application of remedies to heal an erosion, the deeper tissues become dense and undergo atrophy.

To the destruction or change in character of the mucous membrane covering the cervix is due much of the anæmia and neuralgia of women.

I do not claim that the general health of every woman who has a scar on the cervix will suffer, or that she will always have neuralgia in consequence. But it has been demonstrated to my mind as clearly as anything we accept as truth in medicine, that there exist a relation of cause and effect under the following circumstances. If a woman receives an injury in labor, as a laceration of the cervix, and is in such perfect health as to be able to withstand the irritation, she may go for an indefinite time without suffering any evil consequences. But if she should ever become anæmic, with this condition of the cervix, she will either be a victim of neuralgia, or will not recover her health until the source of irritation has been removed by the surgeon, or by nature after she has gone through a change of life.

Twenty-five years ago or more, it was the practice to apply nitrate of silver to the cervix for almost every condition, real or imaginary. It was then rare to find a woman who had been so treated, whose cervix uteri was not hardened to an extreme degree.

These women were as a rule martyrs to neuralgia, and were as commonly anæmic. Many became addicted to the use of opium, and not one obtained relief unless the cervix was amputated, or they lived until a change was brought about after the menopause. Let me remind the reader that I am not advocating amputation of the cervix, by which the surface would be left to heal by cicatrization. There are special objections to the presence of cicatricial tissue, which have been already treated of, but not in this connection. Here the difficulty lies not so much in the character of the tissue as in the fact that the fibres of the sympathetic become involved in the contraction.

Now that a certain time has elapsed since this practice has gone into disuse, it is rare to find a woman suffering to the same extent as it formerly was to meet with one who had no suffering. My case-books demonstrate the fact that for every woman which I am now called upon to treat for neuralgia I had five under my care fifteen or sixteen years ago, when I began to study this condition.

So much has already been advanced on this subject in different parts of this work, that it cannot be dwelt upon at much greater length without repetition. The various lesions of the cervix which result from childbirth, and become reflex sources of disease, have also been fully treated of elsewhere, and my chief purpose in referring again to these morbid conditions is in reference to certain affections of the mucous follicles within the canal.

The exaggerated action of these glands, and the frequent recurrence of inflammation in them, are so often dependent on a diseased condition of the connective tissue of the pelvis, that it is to be suspected in every case. Sufficient has also been stated regarding the treatment of erosions which follow upon this increase of secretion, and no further allusion to them need be made here.

Single Nabothian follicles sometimes become inflamed and reach a large size, so that they can be easily felt with a probe projecting at some distance into the canal. These growths always excite a great deal of local irritation, and cause an increase of secretion. The most effective method of removing them is to clip them off with a pair of scissors, after first catching up the mass with a tenaculum, which may also serve as a guide. If necessary to facilitate their removal, the canal should be dilated, and afterwards a free application of iodine should be made to the denuded surface.

Whenever the follicles undergo cystic degeneration, they should be punctured so as to relieve the pressure they exert on others in their neighborhood. The formation of these cysts frequently excites a great deal ef nervous disturbance, and fully illustrates the effects of pressure on the sympathetic fibres. It is seldom that I have not had some patient under my care suffering from this cause, and they often return to me at long intervals, recognizing from their feelings the necessity for having the cysts punctured. I have a lady under my care at present who is so sensitive that as soon as a single cyst develops she immediately returns for relief. I have seen her about once in six months during the past five years, and she has not been mistaken upon any occasion as to the cause of her pain.

When within the canal they cannot be so readily reached, and when detected, from the rough surface presented by them, they are best ruptured by means of Thomas's dull wire curette drawn over their surface with some degree of pressure.

These follicular growths sometimes undergo development into the ordinary mucous polypus, from which the loss of blood is generally excessive. They are occasionally found in young women, but, as a rule, they are developed in middle life, or as the woman approaches the menopause. After a change of life has taken place, and the cervix has disappeared, these growths are found hanging free in the vagina. So long as they remain within the uterine canal they are a source of irritation which leads to hemorrhages; but when they hang free in the vagina, the tendency to a loss of blood ceases, and they no longer cause any irritation. There is a stage, however, in the growth when the polypus protrudes just enough to close the os and cause retention of the secretions within the uterus. When this discharge, already partially decomposed, escapes by degrees into the vagina, its presence often causes itching, and sometimes keeps up a vaginitis. This form of polypus will, as a rule, be found presenting at the os if the examination be made just at the close of menstruation. If there is bleeding from the uterus, and no particular cause can be detected, it is always the proper treatment, as a first step, to dilate the canal.

When brought into view this growth is, in appearance, not unlike a mass of tenacious mucus saturated with blood, and it bleeds on the slightest touch. If seized by a pair of smooth forceps, and drawn out, its pedicle can be traced with a probe to some distance within the canal. The natural impulse is to tear the growth away; this can be readily done, but if force be used an attack of cellulitis will be more likely to result than after the removal even of a large pedunculated polypus. I have had cellulitis occur several times from twisting off such a growth.

There certainly exists a closer relation between the mucous membrane of the vagina, the uterine canal, and the peritoneum and connective tissue of the pelvis, than is generally supposed. I now always divide the pedicle close to its attachment with a pair of scissors as the mass is held on the stretch by forceps. After its removal an application of iodine should be made, but not until the canal has been syringed out with tepid water should a sponge tent be used. Although there may be no bleeding, it is always a prudent precaution to use a moderate tampon, and to keep the woman quiet in the recumbent position for a few hours after the operation.

Disease of the Lining Membrane of the Uterus.—We will now consider a condition of the lining membrane of the uterus which is exceedingly common, and but little understood. With women who have had a number of children, or who have miscarried frequently, certain changes take place which render them liable, not only to excessive menstruation, but sometimes to loss of blood in the interval. The uterus is always larger than natural, but not sufficiently so to indicate the presence of a fibroid or of any internal growth. The patient will date her disease from the birth of a child, or from a miscarriage, in which case the difficulty may be frequently traced to a small portion of placenta which has become so organized as to resemble an outgrowth from the uterine surface.

Microscopists have not yet, to my knowledge, fully investigated this subject, and I cannot speak with authority, but it is evident that there are several distinct conditions capable of giving rise to the same symptom. Practically, this fact is of little importance, since, whatever the condition, or if two or more coexist, the treatment will be exactly the same.

We must bear in mind that the uterus has a mucous membrane only as far as the internal os, beyond which the lining membrane is an outgrowth, as it were, from the muscular tissue. It is, therefore, free from mucous follicles, and consequently it can be determined by the microscope whether the disease is located above or below the internal os.

A condition is frequently met which some writer has compared to the granulations of conjunctivitis. Again, large flabby granulations, or fungosities, may exist at several points in a mass together, which bleed on the slightest touch. The favorite site for these is in one or both cornua of the uterus, from which cause their presence is frequently overlooked.

A common form of outgrowth, found in the upper portion of the canal, resembles closely the long pile of velvet cloth, and when floated in water it seems to consist of prolongations of bloodvessels from the muscular tissue.

I have also noticed a thickened condition of the lining membrane, which could be easily detached in long strips, like the skin which has been scalded, and it is blanched in appearance. It seems as if it were soaked in water, or as if macerated from the constant flow of serum which generally accompanies the condition when there is no hemorrhage.

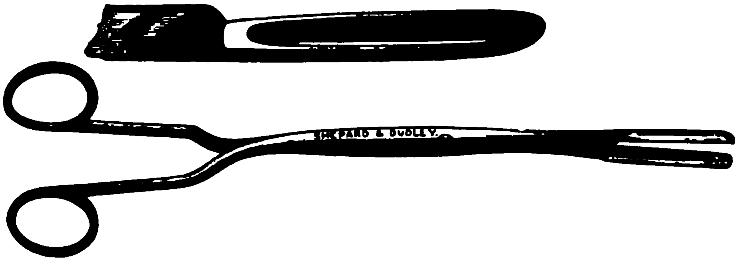
But one mode of treatment promises relief, viz., to remove the growths entirely, leaving a healthy surface exposed. It is important to do it properly, and with the least risk to the patient. Récamier devised the curette for the removal of these growths, an instrument which has proved a most objectionable one. The same instrument has been modified by Simpson, Simon, and Sims, without removing the objectionable features. As regards the instrument of Dr. Sims, I honestly believe that the ingenuity of man has never devised one capable of doing more injury.

Women suffering from these growths are all exceedingly anæmic from the long loss of blood during menstruation, and from the leakage of serum which has continued in the interval. A woman with anæmia is always very susceptible to blood poisoning after an operation for this condition, and peritonitis is likewise not an infrequent sequel. I have known peritonitis, cellulitis, pelvic abscess, and even death, to occur on removing these growths from the uterine canal with a curette, and in every instance the operator was dexterous in the use of the instrument. My views are based on a dearly bought experience, and I believe that no man has a right to place the life of his patient in jeopardy by the use of either of these instruments in the treatment of this condition. Their use should be limited to the removal of malignant disease, under certain circumstances, and then only with the greatest care, for the walls of the uterus have been perforated by them.

These growths are difficult to find, and it is rare that they can be detected by the use of the sound or probe, and if the canal be dilated to any extent by means of a sponge tent, they become so compressed that the finger cannot appreciate their presence, and consequently the physician is frequently misled. The use of the curette is certainly a great aid for establishing a diagnosis, but unfortunately it removes both healthy and unhealthy tissue. The copper wire loop devised by Dr. T. G. Thomas is a safe, and, as a rule, an efficient means for the removal of these growths. It is an excellent instrument for use in the condition where the membrane is thickened, and there is nothing to be brought away. By drawing the loop with some pressure over this surface, so great a modifying effect is established in the nutrition of the parts that it seldom fails to arrest the tendency to bleeding. It is also as effective in breaking up the soft villous growths, but not so good for granulations of a firm consistency. For more particular information as to the use of the dull wire curette, and its applicability in the diseases of the uterine canal, the reader is referred to Dr. P. F. Mundé's admirable papers in the Edinburgh Medical Journal for March and April, 1878.

I have for many years realized the danger attending the use of Sims's curette, and have devised another instrument which has proved efficacious, and its use is singularly free from bad consequences. I began with a pair of forceps made for other purposes, and modified them into the present shape, which has remained unchanged for the past ten years. I had the blades constructed in shape like two of Simpson's scoops coming together so that a cross section of the two, when closed, would be not unlike the figure 8 (see Fig. 105). The great advantage of the instrument is that it can remove only what projects above the common level. This it crushes off sufficiently close without dragging upon or injuring the surrounding tissues.

Fig. 105.



Emmet's curette forceps.

The proper mode of operating is to place the patient on the left side, and the speculum is used. There is so little pain attending the procedure that scarcely a necessity exists for an anæsthetic, but my rule is to administer one, for it has given me better results, and I believe that it does much towards assuring the patient. It also gives the operator greater facility by relaxing the parts, and affords him more time for the thorough removal of the growths than he would have if he were anxious to terminate the operation on account of the emotions of the patient.

As a rule, in these cases the canal is sufficiently open to admit of the passage of the curette forceps, but if further dilatation be required, the judicious use of the forceps themselves will frequently accomplish it. When a sponge tent is used, it should not be a large one nor long enough to reach to the fundus. It is only necessary to dilate as far as the internal os, and too long a tent should not be used. Sometimes a large tent is a most efficient means for destroying these growths, as shown by the history of a case detailed in one of the early chapters of this work, but as the pressure must be kept up for several days, it is attended with considerable risk of blood poisoning.

Before introducing the forceps the uterus must be gently drawn down near the outlet, by means of a tenaculum caught in the anterior lip. When brought within range, so that the fundus presents in the direction of the promontory of the sacrum, it will be easy to introduce the forceps without employing much force. They are to be dipped in warm water, and slightly smeared with glycerine, before being passed up into one or the other cornu. When the extremity of the instrument has reached the desired point, its jaws are to be gently separated, then closed firmly together, and withdrawn. By shaking the end of the instrument in a basin of water, anything which has been brought away will be easily dislodged. The operator can thus systematically pass over the whole surface, and without exerting the slightest violence. When satisfied that there remains nothing more to be removed, the canal must be gently washed out by means of a long-nozzled hard-rubber syringe. This will be the most efficient means for guarding against the occurrence of blood-poisoning by removal of all the débris. Then a free application of iodine to the fundus must be made to excite contraction of the uterus, by which the quantity of blood circulating in the organ will be diminished. A small tampon of cotton, saturated with glycerine, should be introduced, and then, under all circumstances, the patient must be kept in bed for several days, as a matter of ordinary caution. Vaginal injections of warm water must be administered freely, night and morning, for a week, even if there should be no discharge.

In anticipation of the next menstrual period, the patient is to be kept in bed for the twenty-four hours before it makes its appearance, and the horizontal position is to be maintained while it continues. Should the flow still continue too free, the operation is to be repeated several days after it has ceased, and there is a certainty almost of finding some growth which was overlooked at the previous operation. After having removed the source of irritation the general health will rapidly improve, and under the occasional use of iodine within the uterine canal the uterus will gradually return to its normal size.

CHAPTER XXXI.

VESICO- AND RECTO-VAGINAL FISTULA.

History and development of the operation—Silver sutures—Button suture—Preparatory treatment—Mode of operating.

A VESICO-VAGINAL or a recto-vaginal fistula may be defined to be an abnormal opening, the result of an accident, between the bladder and vagina, or between the rectum and vagina, through which the contents of either may escape.

It would scarcely be in keeping with the practical character of this work to give the history of the early efforts made to close these openings. Although over two hundred years ago, in Holland, a vesico-vaginal fistula was brought into view by means of a speculum, and sutures were applied to it, little progress was made in any method of cure. In France, even up to the close of the first quarter of the present century, the problem remained unsolved, notwithstanding it had engaged the attention of the great surgical minds of the day.

To J. Marion Sims the world is indebted for suggesting and perfecting the measures by which this formerly almost intractable condition is rendered one of the most certain of relief within the field of surgery. It is true that in every particular feature of the operation, on which his success depended, Dr. Sims had been anticipated. In our own country, Dr. H. S. Levert,[1] of Mobile, Alabama, had published (American Journal of the Medical Sciences, May, 1829) his experiments in the use of silver wire. Mr. M. Gosset, in a letter to the London Lancet, Nov. 21, 1834, gave an account of his method and success in closing a vesico-vaginal fistula which had been produced by the cutting through of a stone in the bladder. He used interrupted sutures of gilded silver wire, which were twisted, and as clearly defines the advantages of the metallic sutures as if given in the words of Dr. Sims himself. The method of Metzler was published in Germany in 1846, and in the article not only is Sims's speculum essentially described, but also the use of clamp sutures, and the mode of denuding the edges of the fistula with scissors, the patient being in the knee and chest position.

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[1] On Kolpokleisis, etc., by Nathan Bozeman, M.D., Richmond and Louisville Medical Journal, October, 1867.

This illustrates what I have often maintained, that ideas and general principles may be new, but that mechanical procedures seldom are. When there is a demand for any invention or device, it seldom fails to be evolved, but it may pass out of use, and even out of memory, only, however, to be recalled, or perhaps reoriginated, when renewed occasion demands it.

In this country Hayward, of Boston, had been successful, between 1836 and 1840, with the silk suture, while Dr. Mettauer, of Virginia, in 1847, had used the lead suture, and in the account of his operation expresses his conviction that every case of vesico-vaginal fistula could be cured. Yet, withal, were we assured of the fact that Dr. Sims was as familiar as we are at the present time with what had been accomplished before his day, it should not lessen the credit due him. What had been done fell on barren soil, bore no fruit, was not appreciated, and was destined to be forgotten. From Dr. Sims's hand the operation was accepted by the profession; it was immediately put into successful practice, and to the present day it has not been materially modified for the better, in either its principles or in its mode of execution. His first article on this subject was published in the Am. Journ. of Med. Sciences, in 1852, and this, with his address before the N. Y. Academy of Medicine in 1857, on "Silver Sutures in Surgery," may be regarded as a summary of his experience, for since the latter date, he has given nothing to the profession on the subject.

Within the period between the two papers, he materially modified the mode of securing the edges of the fistula. At first he employed the clamp suture, which was but the quill suture, through which the wire passed, each end being held by a perforated shot which was compressed at the proper point for the purpose of securing it. Finally he adopted the simple interrupted metallic suture secured by twisting, as Mettauer and Gosset had done before him.

My association with Dr. Sims began at so short a period previous to his adopting the interrupted suture, that I am unable to judge from my own knowledge as to the merits of the controversy between him and Dr. Bozeman in regard to their respective claims for priority. I can only testify as to the value of the method as taught by Dr. Sims, my judgment being based on an experience now greater than his own, and probably unsurpassed by that of any other operator.

One of the most important features in Dr. Sims's practice was the careful preparation of every case previous to the operation, and this was the custom when I first became connected with the Woman's Hospital, in 1855.

It is claimed by Dr. Bozeman that this practice was original with him, and that he first pointed out its necessity. Dr. Bozeman has maintained, by various articles in the medical journals, that he devised the button suture, in May, 1855, and instituted the practice of freely dividing cicatricial bands, and of dilating the vagina for the purpose of freeing the tissues before attempting to close the fistula.

In certain cases, when the cervix had been lacerated for some distance up the canal and above the fistula, Dr. Bozeman seems to have been the first to repair this injury. This was done that the fistula might be closed, so as to leave the uterus in a natural condition in the vagina, instead of turning the cervix into the bladder as is sometimes done. I have always followed the same plan when it could be employed, as the proper one, and had done so without any knowledge of Dr. Bozeman's claims of priority, which are certainly just.

Since 1855, Dr. Bozeman has continued to use what he terms the "button suture." This is a perforated disk of metal made slightly concave, and fitted accurately to the vaginal surface about the edges of the fistula. Through one of the holes in the row down the centre, the two ends of the suture are passed together, and over these a perforated shot which is then compressed at the point needed to secure the sutures. Dr. Bozeman has long since reached a degree of dexterity and skill in this operation, by which nearly every case coming under his care is cured, if the condition of the tissues will admit of this being done without sacrificing the generative function. This result I believe to be due more to his skill than to the special method of securing the edges of the fistula, for the results are equally as good with the simple interrupted suture. In fact, I believe for the general practitioner the interrupted suture is to be preferred to the button suture, for this certainly requires more practice for its successful application. When Dr. Bozeman establishes his claims to having been the first to employ the system of preparatory treatment now in general use, it will entitle him to far more credit than is to be gained from the invention of any special suture. When a case has been properly prepared for an operation, the edges of the fistula being freed from tension and well denuded, it will matter little whether metallic suture or silk be used, the interrupted suture or "the button." A piece of sticking-plaster, if it would hold, would answer every purpose, for without regard to the sutures, all methods fail, as a rule, if the first steps are not properly appreciated by the operator.

Into the merits of the controversy between the late Dr. Simon, of Heidelberg, and Dr. Bozeman I cannot enter, but certain features of the practice of Prof. Simon, as given by himself, are of too much general interest to be passed over. If the success claimed by Dr. Simon be up to the standard of what is generally considered as success in this country, our experience will amount to little, for what we have considered as most essential will be shown by his methods and results to be of no importance. He did not admit the necessity for any special preparatory treatment; he used silk instead of metallic sutures; he allowed his patients to get up and walk about; and discarded the use of the catheter, allowing the patient to evacuate the bladder at will. He always operated with the patient on the back, with the legs flexed on the abdomen, while, from the number of appliances he found necessary to bring the parts into view, it is very evident that he only partially appreciated the efficacy and simplicity of Sims's speculum. One of two alternatives impresses me as the explanation of these peculiar features. Either the destruction of tissue is not so great in Germany as it is in a large proportion of the cases received in the Woman's Hospital, or Prof. Simon did not succeed as a rule in uniting the edges of the fistula. I make this assertion because I have demonstrated to my entire satisfaction that his plan of treatment cannot be successfully employed, except in those cases in which the fistula is very small, and in which there is a redundancy of surrounding tissue. Nor is it possible, under the most favorable circumstances, to cure so large a proportion of cases as he claims by a single operation. The explanation, in all probability, rests in the assertion made by Dr. Bozeman, in the paper previously referred to, that in a large proportion of Prof. Simon's cases the fistula was not closed, but that retention of urine was secured by the operation of kolpokleisis, as it is termed. This operation consists in shutting up the vagina in part or entirely, and is a practice which is not indicative of advance in this branch of surgery if commonly employed, nor is it one which is likely to be of permanent benefit to the patient. But this subject will be again referred to when considering the different forms of fistula and the methods for closing them.

Treatment Preparatory to the Operation for Vesico-vaginal Fistula.—Unless the greatest care be given to cleanliness, a woman will become a great sufferer and a most loathsome object in a few weeks after receiving this injury. The external organs of generation become excoriated and œdematous from the irritation of the urine, and the same condition extends over the buttocks and down the thighs. The labia are frequently the seat of deep ulcerations and occasionally of abscesses. The mucous membrane of the vagina is in part lost, and the abraded surface speedily becomes covered at every point with a sabulous and offensive phosphatic deposit. If the loss of tissue has been extensive, the inverted posterior wall of the bladder protrudes in a semi-strangulated condition, and is more or less incrusted with the same deposit and bleeds readily. This deposit frequently accumulates to such an extent in the vagina that the woman is unable to walk or even to stand upright without suffering great agony.

The first indication is to remove this deposit carefully, as far as possible, by means of a soft sponge, and then to brush the raw surface over with a weak solution of nitrate of silver. If at any point the deposit cannot be removed at first without causing too much bleeding, the deposit itself must be touched with the same solution or have the solid stick applied to it. Frequent warm sitz-baths will add greatly to the comfort of the sufferer. The vagina must be washed out several times a day with large quantities of warm water. This portion of the treatment is beyond question the most important means at our command for restoring the parts to a healthy condition. The difficulty in keeping open an artificial fistula made for the relief of cystitis, is due to the cleansing measures employed, and should teach us a lesson in reference to the treatment of accidental fistulæ. In artificial fistulæ the raw edges are kept in a healthy condition by the frequent use of the injections, and free from the irritation always exerted by a deposit from the urine. Whenever this is done, the largest sized artificial opening will often rapidly close of itself. Very few cases have been admitted to the Woman's Hospital with vesico-vaginal fistula until several months had already elapsed after receiving the injury. I can only recall two instances where women were sent to the hospital with this lesion immediately after delivery. In both of these cases the fistula into the bladder closed within a month, having had no treatment but the warm-water injections, and were discharged cured without an operation. It is true that no great loss of tissue had taken place in either case, yet the openings were large enough for me to introduce my index finger through them into the bladder. One of these cases was delivered, I believe, by Dr. Emily Blackwell, in consultation, after a tedious labor due to a contracted pelvis. The records of the other case have been lost, and cannot be found in the hospital books. Case XXV., in the "Abstract of Cases," is one of these, and is, I believe, the one delivered by Dr. Blackwell. This woman was five days in labor, and finally delivered by forceps, an opening into the bladder as well as a rectal fistula resulting. The opening into the bladder closed in three weeks, and the retentive power was actually gained before the likelihood of such an occurrence was ever suspected. She was afterwards admitted for the cure of the rectal fistula, which required several operations, and which, from its position, had not been so much benefited by the injections.

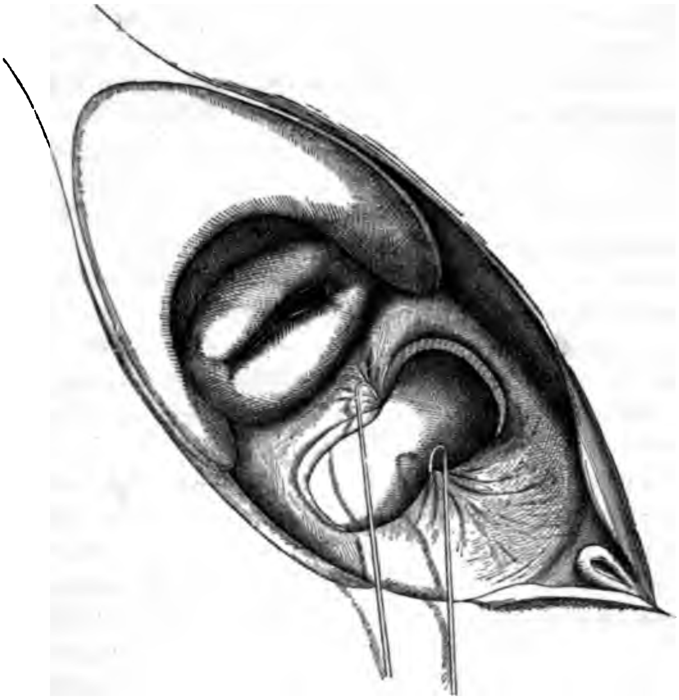
These cases certainly teach an important lesson, and my experience in the use of hot-water injections leads me to believe that if they be properly employed, many of these openings would close spontaneously, and in every instance the sloughing process would be arrested. This remark is applicable to all other injuries dependent on childbirth, and particularly so for laceration of the cervix, a large proportion of which would be healed by the judicious use of hot water. After the sitz-baths or the injections, the parts must be thoroughly dried, and the patient be protected from the effects of the urine by freely anointing the outlet of the vagina and neighboring surfaces with some simple ointment of a proper consistency. The napkins particularly must be well washed when saturated with urine, and not simply dried before being used again. Time and increased comfort to the patient will be gained by proper attention to such details.

The urine is almost always phosphatic, and must be kept in an acid condition or there will be no local improvement. The following agents I have generally used for this purpose: two drachms of benzoic acid, and three drachms of borax to twelve ounces of water, of which a tablespoonful, further diluted, should be given three or four times a day. After the urine has become acid, the dose must be reduced to the smallest quantity by which the acidity can be maintained, so as to avoid deranging the digestion. At the same time diluents must be freely employed so as to render the urine less irritating.

About every fifth day, the excoriated surfaces yet unhealed should be protected by an application of the solution of nitrate of silver. It is often necessary to pursue the same general course for many weeks before the parts can be brought into a healthy condition. This state is not reached until not only the vaginal wall but also the hypertrophied and indurated edges of the fistula have attained a natural color and density. This is the secret of success, but it is one which is rarely appreciated, and yet without it, the most skilfully performed operation will almost certainly fail.

When the proper condition has been brought about, the surgeon may then be able to decide upon some definite plan of procedure for closing the fistula. After placing the patient on the side and introducing the speculum, the edges of the opening should be seized at opposite points with a tenaculum held in each hand, and the degree of tension judged of by approximating the edges in different directions.

Fig. 106.



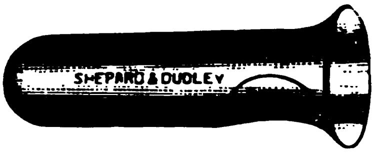
A vesico-vaginal fistula, shown with Sims's speculum.

If at any point they do not come readily together, the finger can detect the seat of resistance while the parts are kept on the stretch by a tenaculum. When the bands are comparatively slight and superficial, or are brought well up by traction, it is generally sufficient to divide them with scissors at the time of the operation for closure. But, on the contrary, when the tension is due to extensive sloughing, or when the posterior cul-de-sac has been destroyed, the parts can seldom be properly freed without more or less hemorrhage following, and it will be necessary to do one or more preparatory operations.

By placing the patient on the back, with two fingers of the left hand, as a guide, introduced into the rectum, and the thumb or index finger of the same hand into the vagina, to make counter-pressure, point after point can be snipped with a pair of blunt-pointed scissors. This can be done to any extent without using the speculum, and without fear of entering either rectum or bladder, if the position of the uterus can be recognized, but the fingers in the rectum should be used as a guide, and a sound should be held by an assistant in the bladder if necessary. When the exact position of the uterus cannot be detected, Douglas's cul-de-sac may be easily entered. This accident has happened to me several times, but without any evil consequences. When it occurs I immediately introduce the necessary number of sutures to close the wound, and then place the woman in bed to be treated as if a fistula had been closed.

After opening up the vagina, as freely as may be deemed prudent at the time, one of Sims's glass vaginal plugs (Fig. 107) should be

Fig. 107.



Sims's vaginal glass plug.

introduced and secured in place by means of a T bandage. It should be only just long enough to put the canal well on the stretch, but not sufficient to produce sloughing or pelvic inflammation. The bleeding is sometimes excessive, but is generally controlled by the plug, and as the instrument is hollow and transparent, it possesses the advantage of a speculum in exposing the parts to view. If the blood, however, should begin to escape, it can be controlled by introducing, with a pair of dressing forceps, portions of damp cotton along the sligh depression in the plug, made for the urethra: then the instrument can be rotated until the outlet of the vagina has been by this means encircled by a tampon. It is remarkable how much absorption of the cicatricial tissue takes place in a few weeks, when judicious pressure has been maintained by this instrument. Scissors are much to be preferred to the knife in dividing these bands. Cicatricial tissue can be lacerated or divided by scissors with far less risk of inflammation, and with certainly less hemorrhage than follows the use of the knife, and the parts do not heal so rapidly when scissors are used, so that time is gained wherein to bring about absorption.

After an operation of this kind the patient should be lifted into bed, to remain there for a week or ten days. The feet should be kept warm, opium administered freely if needed, and hot applications made to the abdomen upon any threat of inflammation. The urine must at first be drawn by the catheter, and without removing the plug, so as not to excite hemorrhage. As the patient lies on the back, the limbs are to be flexed over the abdomen, thus exposing the mouth of the urethra, and the catheter can then be readily passed along the canal without being compressed. As soon as suppuration begins the plug will become loosened, and it will then be safe to remove it. At once injections of warm water with a little old castile soap added must be employed, and frequently if the discharge becomes profuse. After the parts have been properly healed, if necessary, the operation for enlarging the canal must be repeated until the object in view has been attained.

Operation for Closing a Fistula.—The bowels are to be thoroughly acted upon by a cathartic, and if necessary by an enema, immediately before the operation.

The patient ought to be dressed in a night-gown and drawers, and have the abdomen free from any constriction about the waist.

It is customary to use an anæsthetic, although a dose of opium is quite sufficient to relieve any pain the patient is likely to suffer under ordinary circumstances, if the vagina is free from cicatricial tissue.

Dr. Simon operated with the patient on the back, using generally three retractors; one to draw down the perineum, and two to enlarge laterally the outlet of the vagina. He also had an assistant on each side. Dr. Bozeman employs an apparatus on which the patient is somewhat in the knee and chest position. It has the advantage sometimes, of enabling the operation to be performed by the operator with but little assistance. When the fistula is closed behind either ramus, or in a fat subject, it is almost impossible to bring the parts into view unless the woman be placed on the knees and chest. As this position is an exceedingly tiresome one, the patient will receive much support from Bozeman's apparatus. But having accustomed myself to another method, I find this one fatiguing.

I prefer the table, which has been described for making the ordinary examinations. The position on the left side leaves the operator free to be seated, and it is very rare that I find any other one is called for. If the patient be covered by a sheet, drawers, and undershirt, her night-gown may be slipped up around the waist, so as to prevent it from becoming soiled, and this should be arranged beforehand by a nurse or female attendant.

The proper position for the patient has been fully described elsewhere.

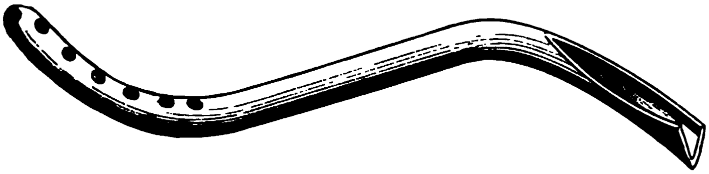
Having decided on the direction for closing the fistula, and having thoroughly freed the flaps, its edges are then to be freshened or denuded. At the most depending point the edge is to be caught up with a tenaculum, and cut away along the inner border in a continuous strip. It will require but little practice to remove this in a single strip entirely around the opening. If the denuded surface is then not of sufficient width, another strip can be removed just outside of it. The freshened surface should be extended as near to the mucous membrane of the bladder as possible, without involving it.

It was Prof. Simon's practice to include the vesical mucous membrane freely. When this is done even by accident, there is always a large amount of blood lost. In my own practice this accident has occurred twice, and on both occasions, the bladder became so distended by a clot that it was necessary to remove the sutures to arrest the bleeding. Dr. Peasleo, a short time before his death, lost a patient in the Woman's Hospital from hemorrhage after this accident. The surface retracted from the edge, and he found it impossible to detect the point of bleeding, or to arrest it by injection. I did not see this case, which was evidently an unusual one. I have been able in some cases to exert pressure by pushing a portion of a thin handkerchief through the fistula; then, as the ends were held, a sufficient quantity of cotton was packed into the bag thus formed. This made a mass in shape like a door-knob, which pressed against the bleeding surface when traction was made on the portion of the handkerchief outside of the fistula. Under ordinary circumstances the bleeding can be arrested by means of a suture passed from the vagina, through the septum into the bladder, then across to some distance on the other side, and then out into the vagina again. In this way, the bleeding vessel, which comes from the neck of the uterus, or from the neck of the bladder, is ligated, as it were, and the bleeding is arrested. One precaution, however, must be taken, to avoid including the ureters, and this can be done by passing the suture at a less distance than half an inch on either side from the median line. It is almost of as great importance to obtain a broad surface for union, so as better to resist the traction.

As the edges are generally too thin after the tissues have been destroyed by sloughing, it will be necessary to extend the denuded surface on to the vaginal wall, or to split the edges to a certain depth. The former plan is the one usually adopted. To bring these surfaces up in a fold together renders it all the more necessary that the parts should have been freed from tension. When this plan is followed it has been asserted that the edges are rolled into the bladder, but this is not true, since the sutures are always introduced at the edge of the mucous membrane of the bladder, so that surface must be brought into apposition, and no tissue can be turned in. The operation, however, is never more than partially successful, unless the precaution be taken to extend the freshened surface some distance beyond each angle of the fistula, until the folds which are formed become lost on the vaginal level. Let the reader pinch up two small folds of a napkin together, when it will be easily seen that these have to be extended to some distance before they can be smoothed down to the common surface. When the necessity for extending these folds has not been appreciated, the operation is always exceedingly liable to fail, on account of a small opening being left at each angle.

I have already described the manner of introducing the needles, each armed with a silk loop, into which the wire is to be hooked. Also the mode of twisting these sutures is given, and of bringing the parts together. These rules are all applicable to the general use of silver sutures, but, in connection with the present subject, it would be advisable for the reader again to refer to the chapter descriptive of their use.

Fig. 108.



Sims's self-retaining, or sigmoid, catheter.

After completing the operation, the patient is to be turned gently on the back, and a catheter introduced. If the urine be discolored, a quantity of tepid water must be injected into the bladder for the purpose of washing out any blood which may have accumulated there. To Sims's sigmoid, or self-retaining, catheter I am satisfied that we are greatly indebted for success in this operation, as well as for much comfort which it affords the patient. It should be made of block tin, that the curve may be altered to suit each individual case. It should not touch the fundus of the bladder, yet it ought to be of sufficient length to properly balance in the urethra, and to lie close up behind the pubes. When the fundus of the bladder rests on the point of the catheter, as it often does when the instrument is not properly balanced, it must be withdrawn, and the necessary change made in its shape. A want of attention to this point will lead to much irritation of the bladder, and will cause a failure of the operation. Perforation of the bladder and death may result from neglect of this, as I have known to happen in one instance.

The catheter is generally made five inches long before being bent to the proper curve; a greater length, however, is necessary if the patient is unusually fat. As a receptacle for the urine, a large-sized oval cup may be used, such as are found in bird cages, or one of any other convenient shape. The catheter must be removed several times a day for the purpose of cleaning it; this is done by forcing a stream of water through it from a large syringe. The patient should be instructed to notice carefully that the urine escapes freely at all times. It is well to have two catheters, so that one may be introduced immediately on the removal of the other.

The patient must lie on the back for the greater part of the time, and, if possible, preserve this position until the sutures shall have been removed. It will add greatly to her comfort to have a double inclined plane, well padded, to support the lower limbs when drawn up, and this can be removed from time to time, so that the legs may be stretched at full length for change of position. The support should be open at the ends, and a portion of the side be removed, so as not to interfere with the catheter.

A sufficient quantity of opium should be administered daily to keep the bowels constipated until the sutures are removed, and the diet may be a generous one, but should be regulated with the view to cause no disturbance of the bowels.

The sutures are generally removed on the eighth or tenth day, and in the manner already described. Twelve hours afterwards a dose of castor oil should be given. The catheter must be continued in use for a few days longer, according to circumstances, and after the fourteenth or the twentieth day the patient may sit up.

CHAPTER XXXII.

DIFFERENT FORMS OF FISTULÆ.

Vesico-vaginal—Urethro-vaginal—Congenital absence of the urethra—Uretero-vaginal—Recto-vaginal.

MY object is to present these lesions as the result of various injuries, but I shall also point out the congenital conditions simulating them. The classification, therefore, will be in a general way made from the point of view of the location of the fistulæ, with some reference, however, to the frequency of their occurrence, and the following order is adopted:—

1. Loss of tissue, confined to the base of the bladder.
2. Injuries of the cervix uteri and posterior cul-de-sac, the fistula being, as a rule, in the upper part of the vagina, although sometimes the whole base of the bladder is also involved.
3. Loss of tissue at the lower portion of the vagina, extending to one ramus or to both.
4. Sloughing or laceration at the neck of the bladder.
5. Injuries to the urethra and defective development.
6. The ureter opening into the vagina, as the result of injury or as a congenital defect.
7. Openings into the rectum from the vagina.
8. Vesico-vaginal fistula from accidental causes.

1. *A loss of tissue confined to the base of the bladder* constitutes the most simple form of fistula. It is fairly shown in Fig. 106, which represents a case in which the septum near the cervix uteri is involved. In such a case, inasmuch as the sloughing has been confined simply to the tissues lost, it will generally be easy to approximate the edges of the fistula in any direction. Whenever a choice exists, the line of union should always be extended in the long axis of the vagina and not across the passage, since this would have the effect of drawing down the uterus more or less. This might result in a form of retroversion very difficult to correct. Under other circumstances, where great loss of tissue has occurred, it becomes necessary to draw down the uterus, and it remains permanently retroverted, but no special

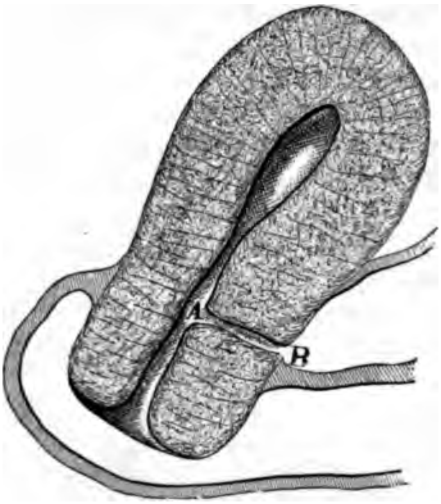
difficulty results from this, since the uterus will occupy the position of the tissue lost. The treatment of these simple cases requires no further direction, since it has been already fully detailed in the general description.

2. *Injury of the cervix uteri and posterior cul-de-sac, the fistula being, as a rule, in the upper portion of the vagina, although sometimes the whole base of the bladder is also involved.* Such an injury results from laceration and from sloughing caused by the presenting portion of the child while it is yet above the superior strait. Anterior lacerations of the cervix directly in the median line and extending into the bladder are the varieties most frequently found. Sometimes a lateral laceration of the cervix on one side, extending into the bladder, seems to have been formed. But I am inclined to regard these lacerations as first occurring in the median line, and from inflammation or sloughing about the cul-de-sac being displaced to one side. This complication, involving the cervix, is of more frequent occurrence among those who have borne a number of children and have the abdominal parietes much relaxed, than it is among primipara. The cause may be suspected, therefore, to be due somewhat to rigidity of the os and an anterior obliquity of the uterus.

In these cases there is almost always some effort of nature to repair the injury. The laceration through the base of the bladder is generally found to have been partially closed by granulation, and that of the cervix uteri entirely so. Occasionally, the whole line will be found bridged over, leaving only a fistulous tract at the bottom of the original fissure, opening into the cervical canal a little above the line of junction with the vagina, as shown in Fig. 109, from *A* to *B*. Sometimes the laceration extends not only into the base of the bladder from the anterior lip, but backward through the posterior one. In these cases the opening into the bladder may close, leaving only a small fistula against the uterine wall, while the tear through the cervix remains ununited. Occasionally the tear both in the cervix and the vesico-vaginal septum will close from each end, thus leaving a small opening in front of the cervix, as shown in Fig. 109.

The passage by which the urine escapes from the bladder into the uterine canal, as shown in Fig. 109, can be remedied only by reproducing the original condition of the injury. This necessity has been long recognized, but no one, so far as my knowledge extends, ever realized the true cause of the lesion until I described it as a result of a laceration of the cervix which had healed over and left the sinus [illegible] the uterine canal and the bladder. It was thought that a slough took place, but this is impossible, since, under all circumstances, the wall of the bladder is subjected to the same degree of pressure, and would be equally injured. The bladder becomes necessarily interposed between the presenting portion of the child and the bony walls of the pelvis, so that the uterine tissues could not be injured without the coats of the bladder being damaged, even to a greater extent.

Fig. 109.

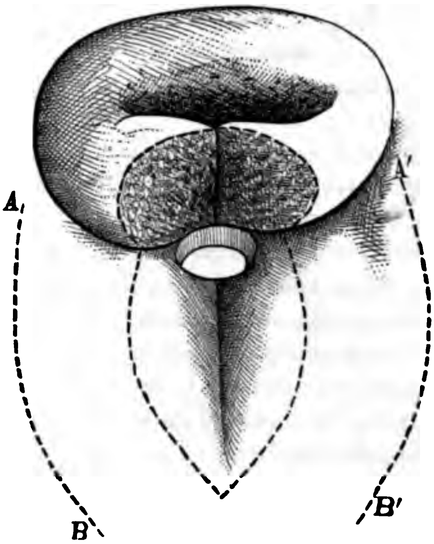


Fistulous tract after healing of a laceration.

I have occasionally met with cases in which a probe could be passed from the bladder along the sinus *A B*, Fig. 109, until brought into contact with a sound in the uterine canal; but these are exceptional. The proper mode of operating is to divide the cervix in the median line with a pair of scissors, through to the vaginal junction; then, by means of a blunt hook, the mouth of the sinus at *A*, Fig. 109, must be found, after which the completion of the operation becomes simple. The whole tract of the sinus must be laid open, and its walls must be removed in a single strip, from *A* to *B*, which may be done with a pair of scissors or with a small scalpel, first catching up one end of the sinus with a tenaculum. A long, straight needle is used to carry the suture, and the flaps are held widely separated, so as to straighten out the course of the sinus, which greatly facilitates the passage of the needle. But it is by no means an easy matter to accomplish this, since, without great care, the needle will be broken off, leaving a portion buried in the uterine tissues. The point at which the needle is to be introduced must be caught up with a strong tenaculum, in order to steady the parts, and the needle, as it is gradually forced through, must be seized and urged on, close up to its of point of entrance within the tissues. When the tissues are more than usually dense it is often necessary to employ a lance-pointed needle or one having a cutting edge. A straight needle, or one nearly so, is the only one which can be directed with any certainty. Each suture must pass beneath the course of the sinus, or the urine will again find its way into the uterine canal. The operation and after-treatment are in every respect the same as for laceration of the cervix.

Usually it will be difficult to bring the edges of the fistula together without removing a portion of the cervix, and it may be necessary to take out a V-shaped portion without going through to the canal, and then to freshen the edges of the fistula and the vaginal surface over a space equal to that represented within the inner dotted lines, Fig. 110. The necessity for extending the freshened surface to such a distance from the angle of the fistula, has already been explained, and it is particularly necessary in this location on account of the great liability to a sinus being formed from each end. The sutures should be introduced transverse to the axis of the vagina, and, if necessary

Fig. 110.



Small fistula in front of the cervix.

to relieve the parts from tension, they should be freed by snipping with a pair of scissors, to a proper depth, the tissues on each side in a direction represented by the dotted lines *A B* and *A′ B′*, Fig. 110.

Whenever the cervix has been lost from sloughing, the posterior cul-de-sac rarely escapes without extensive injury. If it so happens that the fistula is small and situated at the median line, it may not require any operative interference, but the woman may suffer indirectly. After the cervix has sloughed away, it is a very frequent occurrence for the uterus to have been damaged to such an extent that menstruation ceases, and atrophy takes place. The effect is the same as if a change of life had ensued, and this is brought about without reference to the age of the woman. I have known of several instances where this has occurred after the birth of a first child, and all the women were under thirty years of age.

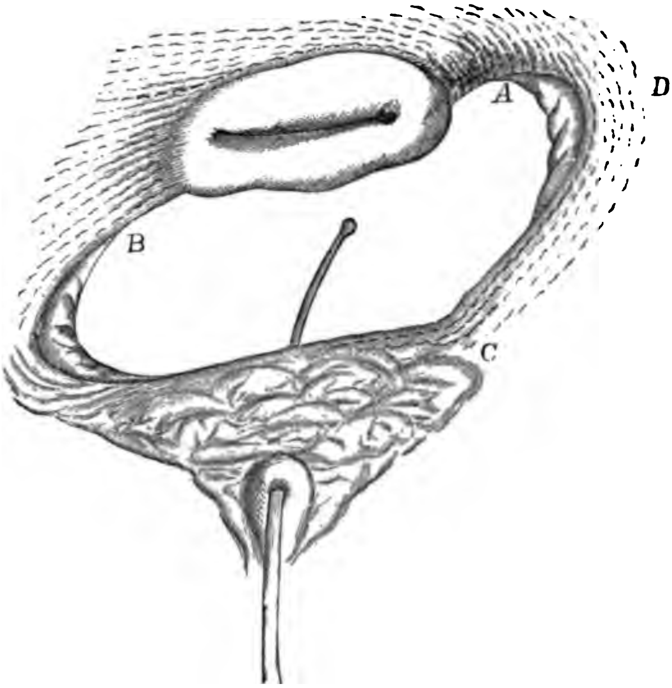
When the sloughing is in the upper part of the vagina, the inflammation frequently extends to the bottom of Douglas's cul-de-sac, with the effect of retroverting the uterus, and not seldom binding it down in the retroverted position. We have seen that the presence of cicatricial tissue in this neighborhood, and in the cervix, produces more or less disturbance of the nervous system, and that it frequently has a marked and deleterious effect on nutrition, and keeps up a condition of anæmia. Much cicatricial tissue is also a serious complication as regards the surgical procedure. When the cul-de-sac is filled by cicatricial tissue, traction is exerted on the edges of the fistula whenever it extends laterally beyond the width of the cervix. The result is to draw one or both of the angles upward, giving a crescent shape to the fistula, and exerting so much traction on the central portion that it is exceedingly difficult even to approximate its edges.

Occasionally, even after the greatest destruction of tissue, the cicatricial bands dragging the edges back into an angle on each side of the remains of the cervix, may be easily divided at the time of the operation. I have had a number of cases where after dividing these bands the edges could be brought together in the median line without shortening the vagina. In some instances the line of union may be made oblique. But the most common procedure is to freely divide the tissue filling up the cul-de-sac, and then to bring about a modifying effect by the use of a glass plug. This operation may have to be repeated, and the use of the plug continued until the neck of the uterus becomes movable. The fistula is then closed by drawing down the neck of the uterus and uniting it to the neck of the bladder. The result is that the vagina becomes very much shortened, and the uterus retroverted, but the latter condition, in consequence of the great loss of tissue, causes little or no disturbance.

Cicatricial tissue can sometimes be utilized as in the following case.

Case XLV.—Mrs. W. was sent to the Woman's Hospital Oct. 1864, by Dr. Frank H. Hamilton. The previous history of the case will be found in the "Abstract of Cases" (No. 34). The entire base of the neck of the bladder had been lost, and a portion of the anterior lip of the uterus, as shown in Fig. 111. The posterior wall and fundus of the bladder protruded through the fistulous opening into the vagina. The cervix was surrounded by cicatricial tissue, and its posterior lip was blended with a mass of the same character filling up the cul-de-sac. The bands were more dense to the right side, and, spreading over the lateral wall of the vagina, extended forward along the sulcus, so as to involve a portion of the anterior lip of the fistula. By the tension thus exerted the fistula was drawn obliquely across the axis of the vagina, carrying the angle on the right side into the cul-de-sac, somewhat posterior to the cervix uteri. When the patient was placed on the knees and elbows, the fistula presented the appearance indicated in Fig. 111, being more than three inches in length,

Fig. 111.



Fistula, involving the whole base of the bladder.

and over an inch in breadth in its widest diameter between the cervix uteri and the neck of the bladder. At each extremity of the fistula the edges were shelving, so as to narrow somewhat the opening on the bladder surface. The mouth of the ureter on each side could be seen in the edge of the fistula at *A* and *B*. The uterus was almost immovable, while the anterior lips of the fistula, in the neighborhood of the neck of the bladder, were quite free. The urethra was uninjured.

At the operation the cervix was freed of its adhesions behind, so that it could be readily drawn down to the neck of the bladder. The division was extended well towards *A*, and, in the direction *B*, nearly to the angle of the fistula on that side. It was, however, purposely not carried entirely across the vagina, in order that the remaining portion of the band running from the cul-de-sac along the anterior lip, *D C*, might, by its traction, keep the edges of the fistula together, free from strain, after the sutures were twisted. But before this force could be brought into action it was necessary to separate the attachment of this band freely in the direction *C D*, from the neighboring cicatricial tissue on the lateral wall of the vagina. As soon as this was done, that side of the fistula was drawn nearly over to the neck of the uterus, and the opposite edges could be brought together, free from tension at any point. As the bladder protruded through the fistula, so as to obscure it entirely when the patient was placed on the left side, it was necessary to perform every step of the operation on the knees and elbows, and nearly two hours were required. With the exception of the shelving portion at each angle of the fistula, no other part of its edge was included in the line of freshening. It was extended a little outside on the vaginal surface, and across the cervix uteri in front of the os. A more uniform or regular line was thus obtained, and the cicatricial edges of the fistula were avoided. The cervix uteri was attached a little to the right of the neck of the bladder, and when the operation was completed, owing to the traction exerted by the undivided portion of the band extending from the cul-de-sac in the direction beyond the point *D*, the line of union was somewhat oblique, but at the same time nearly in the axis of the vagina.

Ten days afterwards, on examination, every portion of the line was found perfectly united; but, in consequence of its great length, it was deemed advisable to leave the sutures in a few days longer. During the night the woman became intoxicated through the kind offices of some outside friends, and was on her feet for several hours. In the morning, the urine was found escaping freely from an opening formed by the tearing out of the last suture in the angle on the right side, and was large enough to admit readily the point of a sound. She was discharged for disorderly conduct, but was subsequently readmitted and cured.

This case beautifully illustrates a mode of procedure of which I always avail myself when possible. It aims to utilize the line of tension exerted by the cicatricial tissue, so that it will contribute di-partly towards approximating the edges of the wound, and thus aid in relieving a strain which might otherwise be too great for the sutures to bear. I am satisfied that this case could not have been cured by any other method. Another point of interest is that the edges, requiring eighteen sutures, presented the longest continuous line I have ever seen brought together in the vagina, with the single exception of a case in the hospital, in which the child's head had passed into the rectum, lacerating the whole recto-vaginal septum from the cul-de-sac through the sphincter ani and perineum. The rent was closed by twenty-three sutures in the vagina, and five through the perineum, with the result that it united throughout. But in this case there had been no sloughing, and the edges within the vagina lay almost in contact.

I have in two instances closed the os when a condition existed like that represented in Fig. 109, page 635, and the menstrual blood was thus turned into the sinus, *A B*, and escaped by the bladder.

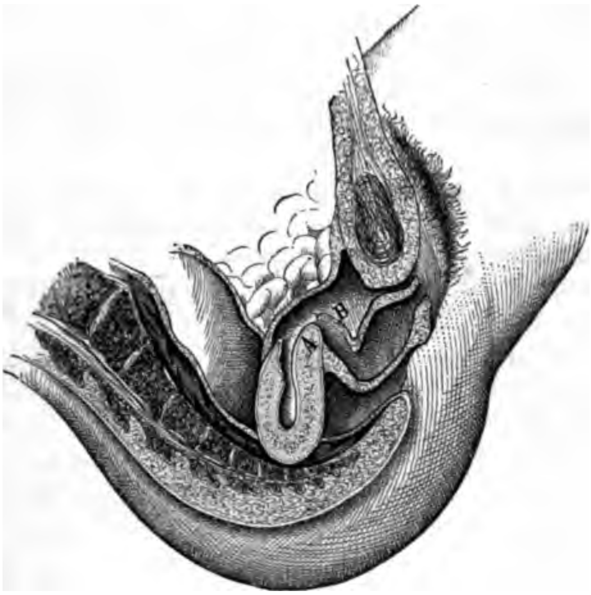
In one case the opening was so high up in the uterine canal, that I deemed it unsafe to attempt an operation for reaching the sinus. To prevent pregnancy, the os was closed in one of the women, as I found the pelvis much contracted, and learned that a delivery had already been so difficult as to greatly endanger her life.

Fig. 112 represents a condition in which the uterus is retroverted and bound down by adhesions. The anterior lip has sloughed away, and from the inflammation extending to the vesico-vaginal septum a fistula has been formed in front of the cervix.

In the case which this represents extensive cellulitis also occurred, followed by sloughing in the cul-de-sac, and on the lateral walls of the vagina. As a consequence, the vagina became shortened, and the vesico-vaginal septum doubled on itself. As the patient lay on the back the finger could be passed into the bladder, with more or less difficulty. But the parts had become so immovable, from the inflammation and contraction, that it was impossible to bring the fistula into view except by means of a hand-glass or a frontal mirror, and a small laryngeal mirror. Although the fistula could be thus seen by placing the small mirror at *A*, it was impossible to make use of the reflected light for either denuding the edges, or for introducing the sutures. The fold in front of *B* was immovable, but I attempted to overcome the difficulty by cutting through at the neck of the bladder, and with a pair of scissors I divided the septum backward in the median line to the fistula. But, in consequence of hemorrhage and of the prolapse of the fundus of the bladder through the opening, and of the falling of the sides together, I failed in every position and with every instrument to obtain a satisfactory view.

In two cases in which I cut through the base of the bladder, after the incision had healed, I closed up the vaginal canal at its upper portion. To accomplish this I freshened as much of the canal as could be brought into view by placing the patient on the knees and chest, and the sutures were introduced so as to unite the sides of the canal at *A B*. This left the uterine canal in direct communication with the bladder, a procedure from which no harm will result if the canal be properly closed; that is, in such a manner that there shall remain no receptacle, or a pouch, for the collection of stale urine, or a sac in which a stone could form. It is doubtless an acknowledgment of defeat, or of a limit to our resources, when such a procedure is resorted to; yet, sometimes we have no other alternative. We must, however, accept as a principle the necessity for obliterating, as far as possible, any cavity in which the urine can remain and become alkaline, and hence phosphatic. Whenever a pouch has to be left, the outlet must be large, and so formed that it will be emptied thoroughly whenever the bladder is evacuated. Unless this is carefully observed no permanent benefit will result to the patient, but, on the

Fig. 112.



Vesico-vaginal fistula, with loss of anterior lip of cervix (uterus retroverted).

contrary, the misjudgment of the surgeon will lead to serious consequences. Sometimes the bad effects may be delayed if the patient can be made to realize the necessity for frequently washing out the bladder through a double canula, but even with this care, permanent exemption from trouble is not to be expected.

Whenever urine is allowed to remain a long time in the bladder, it decomposes and becomes phosphatic, and cystitis invariably results, leading to œdema of the submucous tissues and obstruction to the mouths of the ureters. When once this condition becomes established, the ureters gradually dilate, and it then remains but a question of time before disease of the kidneys develops, with death, from uræmia, as the consequence. It often proves a fortunate occurrence for the patient when an encysted stone is formed. This either cuts through into the vagina by an ulcerative process, thus affording the needed relief, or so much irritation ensues, at a comparatively early stage, that the surgeon is compelled to interfere.

There exists no greater malpractice in surgery than the procedure which, we are told, was practised by that great master, the late Prof. Simon, of Heidelberg. He never seemed to appreciate the importance of the principle which I am now endeavoring to impress upon the reader. Without hesitation he would shut up the vagina when difficulties presented themselves in bringing together the edges of a fistula, as if the sole object was to give a retentive power regardless of the consequences. From my own observation I have learned that it is but a question of a few months, a year, or possibly two, before serious consequences must arise after leaving a receptacle, like a portion of the vagina, in which the urine may stagnate. To give a retentive power for so short time is not a sufficient compensation for the suffering and consequences which supervene. As the result of my experience, I would urge that the operation should never be resorted to under any circumstances. The maximum has now been reduced to two or three per cent. of cases where the resources of the surgeon cannot overcome all the difficulties which may be presented in closing a vesico-vaginal fistula. Something more may be accomplished in the future; but, at present, these incurable cases are better without the retentive power when gained by Simon's method. The surgeon endeavors to cause the parts to heal thoroughly, and educate the patient in the art of taking care of herself, and in this way much can be done to render her condition a comfortable one.

Whenever the destruction of tissues has been so extensive as to permit the inverted bladder, filled with intestines, to protrude from the labia in an almost strangulated condition, some surgical relief is imperative. In such cases I do not hesitate, with the consent of the husband, to unite the sides of the vagina at any point within the canal at which I can gain the needed support for the bladder. This is done to relieve the suffering attendant upon the prolapsed bladder, and it is very effectual. But I always leave an opening at the most dependent portion, and one above, so that the urine cannot accumulate, and the parts may at any time be washed out if necessary. After the surfaces have all healed, and the woman has learned to keep herself free from excoriations, her health will remain good, and the escape of urine will be comparatively but a slight inconvenience. Certainly no comparison can be drawn between the comfort of one with retentive power at the cost of cystitis and its consequences, and the other in a healthy condition, with the urine escaping into a cloth or some other suitable receptacle.

3. *Loss of tissue at the lower portion of the vagina, extending to one ramus or to both.* It is an exception to the rule to find a small fistula in close contact with the bone. This usually happens in connection with the loss of a large portion of the base of the bladder, by which the inner face of one or both rami becomes denuded, so that the surface of the bone, covered with its periosteum only, forms a portion of the fistulous edge. It may prove an easy matter to free the edges of a large fistula so that they can be brought in contact from any direction, but the line of union must terminate in a triangular opening, the base of which will be formed by the ramus. It then becomes impossible to close such an opening in the same line, beyond a certain point, even with a superabundance of tissue. The usual plan is to unite the edges of the fistula, by one operation, up to the ramus as close as can be done, leaving the triangular space for a subsequent operation. To close such an opening against the inner face of the ramus, in even a thin subject, where it can only be brought in view with difficulty, is one of the severest tests of the surgeon's skill in manipulation. But from the fact that the line of the ramus separates and diverges from the edge of the fistula, such a condition must be incurable.

One of two plans may be followed for closing an opening in this situation. A flap may be dissected off from the vagina above and brought down over the opening, the mucous surface of the flap being turned in towards the bladder. Or the tissues may be dissected from the base, and as they recede the edges of the fistula will become free, and a sufficient distance be gained between the fistula and the ramus to allow of the passage of sutures. This plan is the one best for the general operator, and is most suitable for the greater number of cases. But the chief danger is from hemorrhage, which may be severe if a large branch of the sub-pubic artery, which runs along the inner edge of the ramus, be wounded. This accident can be avoided by using a pair of scissors to free the tissues from their close union with the bone, the parts at the same time being kept on the stretch by the traction of a tenaculum. When it is necessary to make an extensive dissection the tissues must be freed with the handle of a scalpel, as the inner edge of the ramus is approached. The line of incision ought generally to be greater in length than in depth, since, after the mucous membrane has been once freely divided, the elasticity of the subjacent cellular tissue admits of great mobility. The operation can seldom be performed in any other position than on the knees and chest. But, under all circumstances, it is exceedingly difficult to introduce the sutures. From the close proximity of the bone, but little space is left to turn the needle, and a number are generally broken before the completion of the operation. By introducing two silk loops, from within outwards, through the edges of the fistula, at opposite points, one loop can be passed into the other and drawn through, so that it becomes continuous, as if only a single one had been passed, and it will then be a simple matter to attach the wire and draw it through in the usual manner.

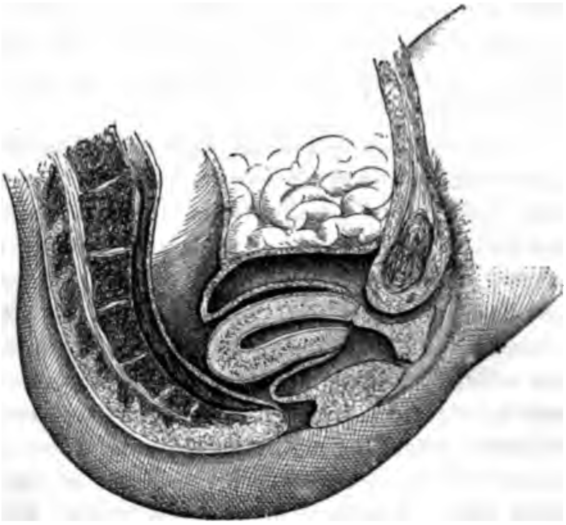
4. *Sloughing or laceration at the neck of the bladder.* The most frequent injury to the neck of the bladder is a laceration, the consequence, in all probability, of traction exerted while the bladder is over-distended by urine. The urethra is not only torn, but also the neighboring soft parts, so that a rent generally extends from one ramus to the other. The portion of the urethra close up to the neck of the bladder soon becomes so dilated that the finger may be introduced through it for some distance within the canal. The mucous membrane anterior to the neck of the bladder protrudes in a hypertrophied mass resembling a prolapsed anus. In the centre of the prolapse the vesical orifice of the urethra will be seen undilated, and corresponding in diameter to the portion of the urethral canal in the anterior flap. At the operation for closing this laceration, it is always difficult to freshen the surfaces in consequence of the prolapsed mass filling up the sulcus; this may be easily returned, but it will at once roll out again. The parts must be approximated over a large-sized sound, which will put the canal somewhat on the stretch, and this will also prove the best means for keeping back the prolapsed tissues

e the sutures are being introduced. To secure the sutures prop-
on each side of the urethra they must necessarily approximate
parallel course in relation to each other, and in so doing the ex-
of tissue would be rolled into the bladder. Notwithstanding the
ed outlet becomes folded somewhat on itself between the sutures
h embrace the diameter of the urethra, yet if they are passed
ı to bring the edges of the canal at each point into exact apposi-
the catheter will meet with no obstruction, and the excess of
e will soon retract.

long with the greater portion of the vesico-vaginal septum or base,
ieck of the bladder also sloughs away. To give retentive power
iese cases, the neck of the uterus has to be drawn down and
ed to the neck of the bladder. By this procedure the uterus be-
s retroverted, and the previous anterior wall is then made to form
ottom, or base, of the bladder. An excess of loose tissue at the
of the bladder gives the woman retentive power in the absence
sphincter muscle. This tissue is generally destroyed extensively
ı a slough takes place in its neighborhood, and then the retentive
r is not always gained by closing the fistula. When the loss of
e has been extensive, and has necessitated the drawing down of
ieck of the uterus, the usual effect of the traction then exerted
pull the remains of the urethra so far back under the arch of the
s that the urine escapes. Sometimes all the urine flows away
the urethra, but sometimes it will only escape in a small quantity,
nly upon sudden effort to expel it. In extreme cases, when the
p of the urethra has been drawn back, the passage becomes as
t into the bladder as if a gimlet hole had been made through its
. In a large proportion of cases the retentive power may be
l by utilizing the neck of the uterus, while sometimes it may also
ecessary to lengthen the urethra, as will be described hereafter.
ı the urine accumulates the bladder rises in the pelvis, and if
an so unite the cervix uteri with the neck of the bladder that it
be drawn up and made to press behind the pubes, retentive power
be secured. The urethra is to be united to the cervix just in front
e os, as shown in Fig. 113, the effect of which is to crowd the
ior lip against the pubes just in proportion as the uterus is dragged
rd. In many cases the desire, or appreciation of the necessity,
npty the bladder, is never regained after extensive sloughing,
ithstanding that retentive power may have been restored by art.
en becomes necessary to empty the bladder at regular intervals,
while many are able to do so by the action of the abdominal

muscles, the introduction of a catheter by the woman herself is the safest plan to pursue. The position on the knees and elbows is the one which will insure the emptying of the urine from the long pouch behind the uterus, and in proportion to the difficulties of the case, the more essential will be the necessity for washing out the bladder from time to time.

Fig. 113.



Cervix uteri united to neck of bladder to secure retention.

5. *Injuries to the urethra and defective development.* Small openings are sometimes found in the course of the urethra, and are generally the result of lacerations. They are easily closed over a large sized catheter, and the line of union should be in the long axis of the canal, that the formation of a band across the course of the urethra may be prevented. The edges of the fistula are generally too thin to be united alone, so that it is almost always necessary to freshen a portion of vaginal tissue. When this has been done, it is always prudent, even if not essential, to relieve the traction by making with a pair of scissors, two parallel incisions on each side of the urethra. A much smaller sized wire should be used for this operation, and the greatest care must be exercised in securing the sutures, so that the parts to be united will be just brought into apposition and no more. The tissues are erectile in character, and with the œdema and concomitant swelling of the parts, the sutures are liable

to cut through, even with all due care. The sutures may be carried entirely through into the urethra, when it is advisable to do so owing to the scanty amount of tissue. And it will do no harm, provided they do not cut out from the traction, for the small passage occupied by the wire will soon contract and disappear after it has been removed. These sutures may be secured by twisting, as is usually done, provided they are properly bent flat to the vaginal surface, where they will not prove a source of irritation. When the operator is sufficiently expert to judge of the proper point at which in tissue of this character the sutures should be secured, a compressed shot will prove the best means for the purpose. Through a hole in the centre of a duck shot both ends of the wire are to be passed, and as these are held in one hand, the shot, in the grasp of a pair of forceps, is slid down to the proper point and then compressed. This is sufficient to secure the ends of the wire, and after these have been cut off close to the shot, there will be less dragging and less irritation. This was the plan adopted by Dr. Sims for securing the sutures in his early operations, and is admirable for vascular and erectile tissues, since by it we can better guard against strangulating the parts.

I have succeeded in restoring the whole urethra by plastic surgery in six or seven cases, but only partially so in others. The operation may be regarded as one of the curiosities of surgery, requiring an indefinite time, and an unlimited degree of patience for its completion. The urethra may be lengthened, and this is an operation to be frequently resorted to. But to construct the whole urethra should never be attempted unless the patient be unusually intelligent, and both she and the surgeon realize fully the greatness of the undertaking, and all of its possible disappointments.

I have had the results of the labor of over three years destroyed in a moment by a woman, who attempted the silly gymnastic trick of letting her body down to the floor, by separating her legs as far apart as possible, foolishly wishing to demonstrate that she was cured and expected an early discharge from the hospital. I have seen the whole urethra lost by the clumsy use of a catheter, and sometimes the same occurs from a want of proper vitality. But after years have been thus spent in opening a vagina, and in bridging over a fistula, or in forming the urethra, a more common fate is to hear that all has been lost in a few weeks, after the woman returned home cured, and all from neglect in emptying or washing out the bladder properly. Therefore as I advance in life, and come to place a lower estimate upon the amount of common sense developed in the average individual, I grow less disposed to waste my energy on the slim chances of success or permanent benefit from this procedure.

Formerly it was my impression that there could be no retentive power, when the neck of the bladder had been lost, unless the new passage was made to enter at as high a point as possible. It was thought, as I have already stated, that as the urine accumulated, the bladder must rise out of the pelvis, and in doing so, that the patulous passage is drawn tight under the arch of the pubis, thus securing a retentive power before the urine had reached the level of the opening. It was customary to make a false passage into the bladder through the sub-pubic ligament, or through the tissues behind the pubes, and when this tract had healed, the new canal, which was to serve as a urethra, was then joined to it.

The risk from retention of stale urine in the bladder, was of course fully appreciated, and that this could only be avoided when it was possible to fully impress the patient with the necessity of washing out the bladder daily. The result of my subsequent experience, however, led me to look for some other expedient to obviate the risk which trusting to the judgment of the patient involves.

On reflection, it occurred to me that with the entrance to the bladder at the most dependent part, but with the canal extended upward in advance of the natural point of outlet, the traction of the cicatricial tissue might be so regulated as to gain a controlling power. Therefore, I made a new canal, somewhat trumpet-shaped, with the idea that if the traction proved sufficient to excite a retentive power, when the pressure of the abdominal muscles was exerted for expulsion, the first portion of urine forced into the funnel extremity, would easily open the canal. It was also thought that the stream, being once started, would be continued by the force behind, and that the retentive power, which had increased with the accumulation, would lessen in proportion as the bladder emptied.

The incisions were made to diverge from without inwards, and directly downwards, instead of passing obliquely behind the flaps. For it had been noted that when the flaps were dissected up, there could be but little lateral traction exerted by the cicatricial tissue on the diameter of the canal, as it was all lost behind and under the arch of the pubis. By separating the lines of incision, the lateral force exerted was greatest towards the outlet, and sufficient in the beginning to arrest the escape of urine, unless forced open with a stream by pressure of the abdominal muscles.

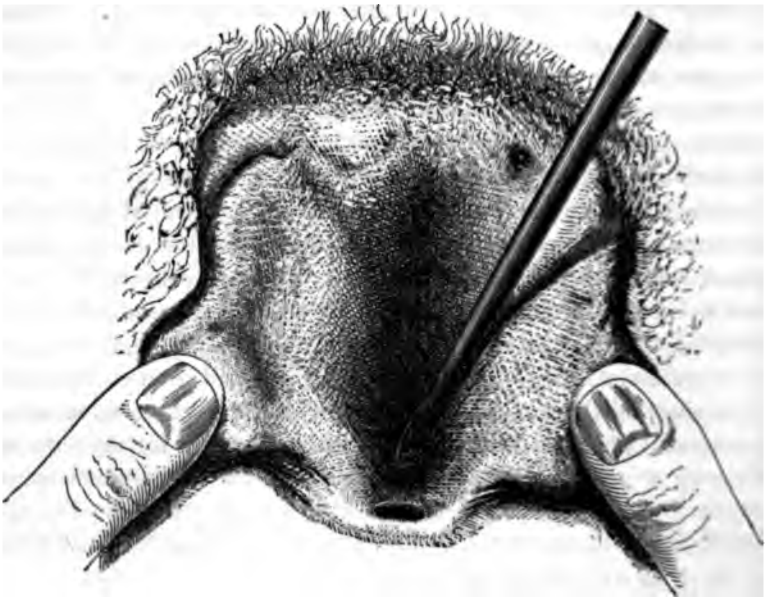
With the accumulation, an increasing retentive power becomes established along the whole canal, in its axis, but which at the same time can be readily overcome at will. In other words, by obtaining the greatest amount of traction which can be exerted by the cicatricial tissue, the triangular surface, between the two incisions, is drawn tense, with the effect of flattening together the two sides of the canal beneath. Then, in addition, with the base of the triangle towards the bladder, any force exerted in that direction would be uniform along the whole length of the canal, and must increase with the traction.

The congenital defects of development are a patulous condition of the canal and a cleft urethra, resembling a harelip. The first condition, when found, is an accompaniment of the congenital absence of the uterus and vagina, and has been already referred to while treating of that subject. The cleft urethra resembles the congenital defect found extending through the anus and the perineum, a condition which has already been treated of. I have seen but a single instance of this congenital absence of the urethra. There had been no retentive power since birth, and she had been under my observation some twelve years when admitted to the Woman's Hospital for the purpose of having a urethra formed. I am indebted to the former house surgeon, Dr. F. H. Hoadley, who had charge of the case, for the following description of the condition and operations instituted for her relief, as well as for the drawings.

CASE XLVI. Miss S., aged 20, was admitted to the Woman's Hospital Oct. 19, 1878. Physical examination shows a cleft where the urethra should have been. The parts below the pubes, over a triangular space two inches and a half from base to apex, with the base above and the apex ending in the neck of the bladder, were flattened and depressed from one-quarter to half an inch below the surrounding tissues, but from all sides sloped towards the centre. The opening into the bladder was free and of sufficient size to easily admit the index finger. Indeed, there was less grasping of the finger by the bladder than by the vagina. The mons veneris was absent; the labia majora were hypertrophied and had an œdematous appearance; the labia minora were rudimentary, and were separated above to the extent of one inch and a half; the clitoris, somewhat larger than normal, was divided, with one-half on each side of the median line. The upper part of the vesical orifice presented a wrinkled appearance, as if under tension, and was marked by radiating lines. The bladder was small, and equal in size to the bulb of a No. 1 Davidson's syringe; the vagina and the uterus were normal.

Dr. Emmet proposed, as a remedy for the urethral deficiency, to remove a strip of mucous membrane, on each side of the median line, from the vesical opening to a point on the pubes, and by bringing together the denuded surfaces, with interrupted silver wire sutures, form a canal, some three inches in length, which would have the same relation to the bladder as a spout would have to a teapot.

Fig. 114.



Congenital absence, or cleft, of the urethra.

The bladder then could be distended to a level with the urethral orifice, and rising in the abdomen would so draw upon the parts about the neck of the bladder as to crowd them up against the arch of the pubes and produce pressure enough to give some retentive power. Of course the patient would only be aware of the bladder being full by the overflow of urine, or she would be always obliged to evacuate the bladder at regular intervals by means of a catheter.

Oct. 22. A preliminary operation was performed by making an opening, through the base of the bladder, to allow of a free escape of urine during the time required for the formation of a urethra. A glass button was inserted to keep the artificial fistula open. The patient was directed to take the benzoic acid mixture (see page 626) four times a day, to prevent the formation of phosphatic concretions from the urine. The external parts were to be kept well anointed with oxide of zinc ointment, and a vaginal injection of hot water was directed to be given three times a day.

Nov. 22, the first operation for forming the urethra was performed. A strip of mucous membrane was removed on each side of the median line, about a quarter of an inch wide, and a little less than an inch

, and these surfaces extended from the neck of the bladder to
ubes. They were brought together by interrupted sutures which
left long and were secured as in the operation for laceration of
erineum (see page 397). It was directed that the parts should
equently bathed with a douche of hot water, as the best means
eeping in check the œdema which would take place under the
mstances in erectile tissue. After the parts had been carefully
they were smeared thoroughly with vaseline to prolong the
s of the bath.

irty-six hours after the operation a small amount of urine was
d through the new canal, and discharged above the line of
es; but in twelve hours after this it passed freely through the
canal, as the artificial vesico-vaginal fistula seemed insufficient.
patient suffered greatly from the tension of the sutures, as the tis-
became much swollen. By means of ten minims of Magendie's
ion of morphine, given once in six hours, she was kept sufficiently
r its influence.

ec. 4. The sutures were removed, and with the exception of a
e suture which had cut out, the line of union was perfect. The
ing was one-fifth of an inch in diameter, and situated about half
in the line, so that a straight sound passed through it directly
the bladder. The patient had begun to suffer from a slight irrita-
fever, but it was readily controlled by the use of quinine. As
pening became smaller from cicatrizing, it became evident that
retentive power had been gained.

ec. 31. The edges of the small opening were denuded, and the
us membrane from the tissues around, so that the fistula was in
nidst of an ellipse an inch and a half in length. This freshened
ce was doubled upon itself and brought together, in the median
by six sutures, thus closing the opening and at the same time
rially strengthening the walls of the urethra. The fistula in the
of the bladder was enlarged so as to give free exit for the urine
at direction. During the night following the operation the urine
d through the urethral canal several times, and after two days
d more or less constantly from between the silver sutures.

n. 9, 1879, the sutures were removed, and a small opening was
l to exist in the urethral canal near the site of the former fistula.

n. 21. As the opening in the base of the bladder had nearly
d, it was enlarged, and Dr. Bache Emmet's glass fistula tube
Fig. 121) was introduced. It was directed that the bladder
d be frequently washed out with hot water, and that the dose of
ic acid should be increased.

b. 11. The operation of Dec. 31 was repeated, with the same
treatment.

b. 25. The sutures were removed, and the operation was found
ssful. The urine passed freely from the bladder through the
The patient was discharged to return home, and advised to
two months before having the final operation for closing the
ing in the bladder.

May 1. The patient returned to the hospital. The artificial urethra was intact, and admitted the passage of a Simpson's sound. The glass fistula tube was found completely closed by phosphatic deposits. The urine escaped freely around the tube.

May 6. The tube was removed, and the artificial fistula closed with six interrupted sutures. It was ordered that the bladder should be emptied every three hours, or oftener if necessary, by means of a soft catheter.

May 14. The sutures were removed, and the fistula was found to be completely closed. Urine, however, escaped by a minute opening now situated at the commencement of the urethra. It was necessary to continue the washing out of the bladder, as well as the use of the benzoic acid internally.

June 3. It was decided on closing the fistula to strengthen, at the same time, the whole line of the urethra, as the previous attempt to do so had been only partially successful. A strip of tissue half an inch wide on each side of the urethral canal was denuded, together with the interspace, and this surface was extended from beyond the fistula to the end of the urethra above, making a continuous line of two inches and a half. This freshened surface was doubled over the urethral canal and secured with eleven sutures. It was evident in the previous operations that the twisted suture, at certain points, caused much irritation from its leverage where so little tissue was included within the loop. To obviate this difficulty both ends of the wire suture were passed through a hole in the centre of a shot, gentle traction was made on the wires with one hand as the shot, in the grasp of a pair of forceps, was slid down to the proper point and there pinched, after which the wires were cut off close. This method of securing the suture was the one first employed by Dr. Sims, and is particularly well fitted for plastic surgery. The same treatment as was employed after the previous operations was ordered to be continued. Six hours after the operation two ounces of urine were drawn from the bladder with a soft catheter.

June 4. The urine flowed freely through the urethra and escaped at intervals from the meatus; three ounces were at one time drawn when it was thought advisable to leave the soft rubber catheter in the bladder.

June 5. A phosphatic deposit was found in the catheter and in the urine. The bladder was washed out several times a day with warm water to which a few drops of nitric acid were added. The labia became greatly swollen and the parts very painful; ten minims of Magendie's solution were given every six hours.

June 7. The condition remained unchanged from the last record. No urine escaped except by the catheter, which was retained in the bladder.

June 10. Eight of the sutures were withdrawn, and the parts seemed well united.

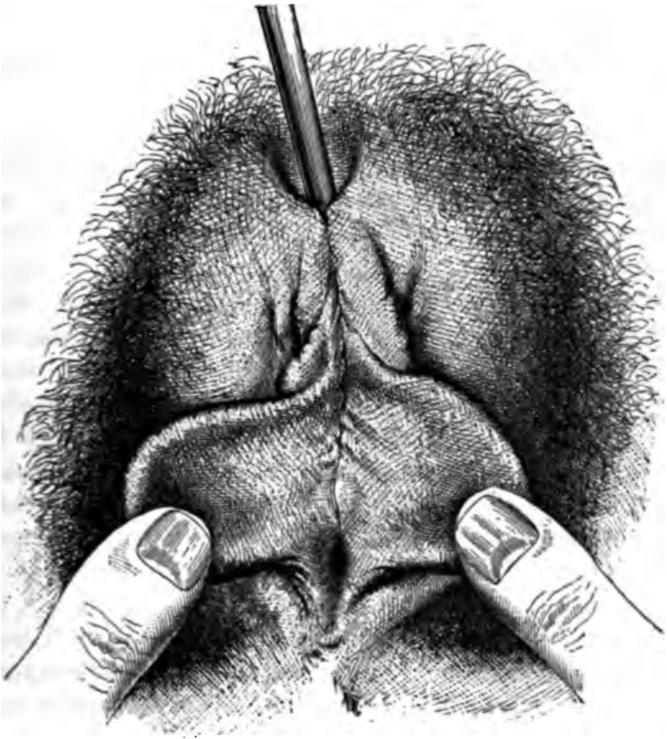
June 12. Two more sutures were removed. The patient had suffered no pain since the other sutures had been withdrawn, and passed no urine except through the urethral canal. The bladder was regularly washed out with the weak acid solution.

June 13. The eleventh and last suture was removed, and the union was found perfect throughout the line. The catheter was withdrawn, but the washing out of the bladder was continued, together with the use of the benzoic acid mixture. The capacity of the bladder was estimated to be about three ounces and a half.

June 23. The patient was discharged cured, with directions to continue the same treatment until all irritation had ceased, and to evacuate the bladder with a catheter every four hours.

The appearance of the parts is well represented by the drawing made by Dr. Hoadley at the time of her discharge.

Fig. 115.



The appearance of the new urethra at the time of discharge.

Nov. 14, 1879. It was ascertained that there had been no increase in the capacity of the bladder since her discharge from the hospital, but she still had the same retentive power.

It was a question, and one of doubt at the beginning, as to the possibility of dilating a bladder which had never been developed, and so far the case was an experiment. But I felt confident of being able to give her retentive power equal at least to the then capacity of her bladder. I have known the bladder to have remained contracted for

its evacuation, on account of its dependent position, and because
ctuation would always be most marked there. This not being the
tural position for the ureter, and it being difficult to determine with
uracy if it is thus abnormally located, it is scarcely possible to
ard against the accident in using a bistoury. As rare as the acci-
nt must necessarily be, even this risk may be lessened somewhat
partially emptying the abscess by means of an aspirator. After-
rds a larger opening can be made, and the distension having been
ieved this would allow the ureter to sink below the level of the
gina. Of course, if adhesions have formed between the ureter and
sides of the vagina, the accident cannot be guarded against.

For the relief of one of these cases I closed the opening into the
gina, hoping that the urine would then find its way into the bladder.
t the operation failed, for after an hour or two the urine forced its
y between the sutures. The woman died suddenly about six months
erwards, and I made a post-mortem examination. It was found
t both kidneys were in an advanced stage of Bright's disease, the
sult of the obstruction to the ureters by an old cellulitis. The
eter, on which I had operated, was adherent to the side of the
gina, as I have described. Its passage to the bladder beyond was
sed, while the canal itself was enormously dilated as far up as the
dney.

The history of the other case is as follows:—

CASE XLVII.—Mrs. B., aged 25, married at 21; sterile. As the
sult of a fall, had been an invalid for two years and a half previous
being admitted to the Woman's Hospital, in the service of one of
colleagues. She had had a pelvic abscess opened at home some
nths previous, since when there was a continuous discharge of pus,
d the urine had escaped freely by the vagina. The urine, however,
d not all escape by the vagina, for she was obliged at certain inter-
ls to evacuate the bladder in the usual manner. Shortly after her
mission an attempt was made to enlarge the opening between the
scess and vagina, but the hemorrhage was so great before the ope-
tion was completed, that the cavity had to be filled with "iron
tton." This was followed by a fresh sttack of cellulitis and symp-
ns of blood-poisoning, and by some bleeding, before the cotton
uld be removed, or before it became loosened by suppuration.
ortly afterwards she was transferred to my service. Her condition
en was one of extreme hectic, with high temperature, rapid pulse,
d night sweats. At least half a pint of pus was being discharged
ily from the abscess through the rectum and vagina, and the cavity
the abscess was filled with a sabulous deposit from the foul phos-
atic urine. After some three weeks her condition began to im-

prove, as the chief source of irritation from the deposit was gradually removed, and the raw surfaces healed. At first an hour or more had been devoted every day to picking off this deposit with forceps, or to injecting a stream of hot water into the cavity to wash it away.

I now advised her to return home to a milder climate, and there to expose her body, for several hours a day, to the direct action of the sun. She was advised to diminish gradually the quantity of morphine to which she had become accustomed, to take from fifteen to twenty grains of quinine a day, and, after a certain time, to begin the use of cod-liver oil. The hot-water injections were to be continued night and morning, being thrown directly into the cavity. The sea-voyage home was of benefit, and she began to improve rapidly.

A year afterwards she visited New York, her general health being entirely restored, and entered my private hospital for the purpose of having something done to control the escape of urine. There was no longer any pus passed from either the vagina or rectum, and this change had been brought about so gradually that she could not say when it had occurred.

I was not confident of success in closing the opening from the ureter into the vagina. Until the exact condition of the canal between the seat of its division and its entrance into the bladder could be ascertained, I was unwilling to undertake any operation. After a while it was found that when some indigo-water was injected into the empty bladder, the urine passed by the vagina remained clear for a certain time, but afterwards it would suddenly become colored and increased to about double the quantity. It was thus made evident that all the urine of one kidney escaped into the vagina without entering the bladder, but after a certain time the bladder would become filled to some point of overflow, by the urine from the other kidney, and discharge into the vagina through a common opening. A probe could be passed six or eight inches backward and upward along the tract of the urethra, as it was supposed, and, with some difficulty, off to the left for the distance of an inch; but to pass it into the bladder was impossible. After a number of careful examinations I ascertained the above facts, but no indication as to the actual condition in the bladder. I determined to dilate the urethra in order to examine the bladder, by the aid of a cylindrical speculum which I had constructed for the purpose. Dr. George T. Harrison and Dr. Bache Emmet assisted me in this, and ether was administered. The urethra was dilated as recommended by Simon, and with the same form of instrument used by him, and the greatest care was taken to employ no violence. The canal was opened without difficulty, but I was afterwards unable to obtain a view of the interior of the bladder or of the mouths of the ureters, as I had hoped to do. I was greatly disappointed to find that the incontinence of urine continued for more than twenty-four hours, by which time the retentive power is usually fully regained. I realized that, in spite of all my care, laceration had occurred at the neck of the bladder, so that every drop of urine escaped, and I was apprehensive that the incontinence would continue.

June 13. The eleventh and last suture was removed, and the union ras found perfect throughout the line. The catheter was withdrawn, ut the washing out of the bladder was continued, together with the se of the benzoic acid mixture. The capacity of the bladder was stimated to be about three ounces and a half.

June 23. The patient was discharged cured, with directions to coninue the same treatment until all irritation had ceased, and to evauate the bladder with a catheter every four hours.

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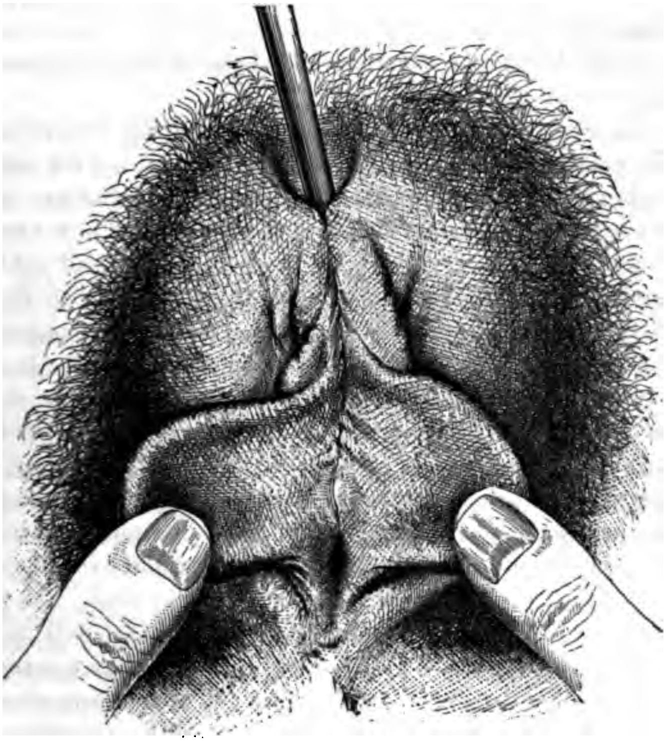

The appearance of the new urethra at the time of discharge.

Nov. 14, 1879. It was ascertained that there had been no increase n the capacity of the bladder since her discharge from the hospital, ut she still had the same retentive power.

It was a question, and one of doubt at the beginning, as to the possibility of dilating a bladder which had never been developed, and so far the case was an experiment. But I felt confident of being able to give her retentive power equal at least to the then capacity of her bladder. I have known the bladder to have remained contracted for nearly forty years, during the existence of a vesico-vaginal fistula, and yet regain full power in a short time after closing the fistula.

The necessity for introducing the catheter frequently, and the imperative one of often washing out the bladder, may prove troublesome and exacting, yet the condition of the case had been vastly improved and the compensation great in being able to keep herself dry and clean.

6. *The ureter opening into the vagina, as the result of injury, or as a congenital defect.* The ureter can scarcely communicate directly with the vagina as a result of childbirth, but when the loss of tissue has been very extensive, so as to involve the ureter in the edge of the fistula, it becomes sometimes rolled out on to the vaginal wall in the process of healing.

It is not a rare condition to find the urine escaping from the ureter into the cul-de-sac, a little posterior to the cervix, but the lesion is always, in my opinion, connected with an attack of cellulitis. In the normal condition the point of entrance for the ureters in the base of the bladder is at least an inch below the level, and about the same distance in front, of the usual opening into the vagina. In fact the ureters have no direct connection with the sides of the vagina, but only indirectly through the connective tissue of the pelvis. It seems not only necessary that a cellulitis should have previously existed, but that it should have terminated in a pelvic abscess to bring about this condition. By means of the abscess, the ureter is dragged up to the level of the vagina at this point, where it becomes attached by adhesive inflammation. As the course of the ureter must then be more or less bent at an angle, the passage of urine to the bladder becomes partially obstructed. This condition, in time, will excite inflammation, and lead to an opening in the vaginal wall through which the urine will escape from the ureter. Whenever this accident has followed childbirth, I am satisfied that the explanation offered as to its connection with cellulitis will be found correct.

Many years ago a case came under my observation where a pelvic abscess had made its way through into the cul-de-sac of the vagina, and afterward all the urine of one kidney apparently escaped by this route. I was then unable to attempt any procedure for relief, and have never known the result in the case. Since that time I have seen two instances where the ureter had been cut across in the same neighborhood by the surgeon, when attempting to evacuate into the vagina the contents of a pelvic abscess. When the abscess is between the folds of the broad ligament, this point would be naturally chosen for its evacuation, on account of its dependent position, and because fluctuation would always be most marked there. This not being the natural position for the ureter, and it being difficult to determine with accuracy if it is thus abnormally located, it is scarcely possible to guard against the accident in using a bistoury. As rare as the accident must necessarily be, even this risk may be lessened somewhat by partially emptying the abscess by means of an aspirator. Afterwards a larger opening can be made, and the distension having been relieved this would allow the ureter to sink below the level of the vagina. Of course, if adhesions have formed between the ureter and the sides of the vagina, the accident cannot be guarded against.

For the relief of one of these cases I closed the opening into the vagina, hoping that the urine would then find its way into the bladder. But the operation failed, for after an hour or two the urine forced its way between the sutures. The woman died suddenly about six months afterwards, and I made a post-mortem examination. It was found that both kidneys were in an advanced stage of Bright's disease, the result of the obstruction to the ureters by an old cellulitis. The ureter, on which I had operated, was adherent to the side of the vagina, as I have described. Its passage to the bladder beyond was closed, while the canal itself was enormously dilated as far up as the kidney.

The history of the other case is as follows:—

Case XLVII.—Mrs. B., aged 25, married at 21; sterile. As the result of a fall, had been an invalid for two years and a half previous to being admitted to the Woman's Hospital, in the service of one of my colleagues. She had had a pelvic abscess opened at home some months previous, since when there was a continuous discharge of pus, and the urine had escaped freely by the vagina. The urine, however, did not all escape by the vagina, for she was obliged at certain intervals to evacuate the bladder in the usual manner. Shortly after her admission an attempt was made to enlarge the opening between the abscess and vagina, but the hemorrhage was so great before the operation was completed, that the cavity had to be filled with "iron cotton." This was followed by a fresh sttack of cellulitis and symptoms of blood-poisoning, and by some bleeding, before the cotton could be removed, or before it became loosened by suppuration. Shortly afterwards she was transferred to my service. Her condition then was one of extreme hectic, with high temperature, rapid pulse, and night sweats. At least half a pint of pus was being discharged daily from the abscess through the rectum and vagina, and the cavity of the abscess was filled with a sabulous deposit from the foul phosphatic urine. After some three weeks her condition began to improve, as the chief source of irritation from the deposit was gradually removed, and the raw surfaces healed. At first an hour or more had been devoted every day to picking off this deposit with forceps, or to injecting a stream of hot water into the cavity to wash it away.

I now advised her to return home to a milder climate, and there to expose her body, for several hours a day, to the direct action of the sun. She was advised to diminish gradually the quantity of morphine to which she had become accustomed, to take from fifteen to twenty grains of quinine a day, and, after a certain time, to begin the use of cod-liver oil. The hot-water injections were to be continued night and morning, being thrown directly into the cavity. The sea-voyage home was of benefit, and she began to improve rapidly.

A year afterwards she visited New York, her general health being entirely restored, and entered my private hospital for the purpose of having something done to control the escape of urine. There was no longer any pus passed from either the vagina or rectum, and this change had been brought about so gradually that she could not say when it had occurred.

I was not confident of success in closing the opening from the ureter into the vagina. Until the exact condition of the canal between the seat of its division and its entrance into the bladder could be ascertained, I was unwilling to undertake any operation. After a while it was found that when some indigo-water was injected into the empty bladder, the urine passed by the vagina remained clear for a certain time, but afterwards it would suddenly become colored and increased to about double the quantity. It was thus made evident that all the urine of one kidney escaped into the vagina without entering the bladder, but after a certain time the bladder would become filled to some point of overflow, by the urine from the other kidney, and discharge into the vagina through a common opening. A probe could be passed six or eight inches backward and upward along the tract of the urethra, as it was supposed, and, with some difficulty, off to the left for the distance of an inch; but to pass it into the bladder was impossible. After a number of careful examinations I ascertained the above facts, but no indication as to the actual condition in the bladder. I determined to dilate the urethra in order to examine the bladder, by the aid of a cylindrical speculum which I had constructed for the purpose. Dr. George T. Harrison and Dr. Bache Emmet assisted me in this, and ether was administered. The urethra was dilated as recommended by Simon, and with the same form of instrument used by him, and the greatest care was taken to employ no violence. The canal was opened without difficulty, but I was afterwards unable to obtain a view of the interior of the bladder or of the mouths of the ureters, as I had hoped to do. I was greatly disappointed to find that the incontinence of urine continued for more than twenty-four hours, by which time the retentive power is usually fully regained. I realized that, in spite of all my care, laceration had occurred at the neck of the bladder, so that every drop of urine escaped, and I was apprehensive that the incontinence would continue.

I delayed making any further examination for nearly a month, hoping that there might be some improvement, but this did not take place, and the patient's condition was evidently beyond artificial relief. Up to this time the urethra had remained sufficiently open for me to introduce my little finger into the bladder, only a slight effort being required to pass the meatus. Having seen, within a recent period, the same condition result, in several cases, from dilating the urethra, I determined to open the bladder with the view of investigating this injury, and to ascertain how far the divided ureter was pervious. This was done November 6, 1875, when I was again assisted by Drs. Harrison and Emmet. After she had been fully etherized she was placed on the left side, Sims's speculum introduced, and I entered the bladder by the method described for making an artificial fistula for the relief of cystitis. The incision was continued with a pair of scissors as close up to the uterus as was deemed safe, and then forward to the neck of the bladder, laying open the urethra in a continuous line for half of its length, without cutting entirely through at the neck of the bladder. Through this long incision a large size duck-bill speculum was passed under the arch of the pubes into the bladder. Sufficient light was obtained to illuminate every portion of the bladder except the part covered by the speculum. With a tenaculum I rolled out the flaps, one after another, on each side, and exposed the mouths of the ureters without difficulty. The probe passed along the course of the right ureter for a distance sufficient to show that it was in a normal condition. On the other side it could not be advanced to a greater distance than an inch, when a solid septum was felt between that point and the opening into the vagina. By introducing another sound in the other part of the ureter, towards the kidney, it was evident that the course of the two portions of the canal were not in the same direction. It was also shown that a sharp turn, or angle, existed between the two points, so that if an attempt was successful in forcing a passage from the bladder, either perforation would occur or the adhesions would be separated from the vagina, and the urine would escape into the peritoneal cavity.

After some difficulty I succeeded in finding the opening where the abscess had emptied into the bladder. It was situated to the left and just below the perineum, where this dips down between the broad ligament and side of the bladder. By inserting my finger into the bladder I was able to advance a probe from the vagina along the tract of the old abscess until it passed into the bladder through the opening I have described above. I also ascertained by this examination that the portion of the urethra entering the bladder was permanently closed, and that nothing remained of the old pelvic abscess but the tract which had been kept open by the overflow of urine from the bladder. As I passed the light silver probe from the bladder along this tract into the ureter, I could feel it by means of a sound introduced through the vaginal opening. This satisfied me fully that I could with safety close the opening into the vagina and turn the urine into the bladder from the left kidney through the tract of the old abscess.

I had opened a portion of the urethra and had partially cut through the tissues, at the entrance of the urethra into the bladder, for the purpose of being able to roll out the parts at the neck and bring the lacerated portion into view. I saw distinctly how this fissure left a crack so that the parts could not fold together properly and re-establish the retentive power. I introduced the sutures into the edges of the divided urethra from the nearest angle of the wound in the usual manner and over a large-sized block-tin catheter tube. The sides of the laceration I carefully freshened, and passed a suture so as to bring together the edges along the mucous membrane, and then to the opposite side through the little strip of tissue which had been left undivided. When this suture was twisted, it simply brought the sides of the laceration together with the divided tissues over the neck of the bladder without in any manner encroaching upon the capacity of the urethra. The remaining portion of the vesico-vaginal septum was left open for the free escape of urine, and to render the use of the catheter unnecessary until the parts just united had regained their natural condition. The operation was successful, and the sutures were removed on the eighth day.

Dec. 5. (The same gentlemen assisting me.) Ether was given, and I closed the vesico-vaginal fistula and the opening from the ureter. The patient was placed in bed, and in every respect the case was treated as after the operation for fistula. At the end of six weeks she returned home perfectly well, and retaining at will every drop of urine. Several months after her return she had a fall down a flight of stairs, and wrote to me in great alarm that she was suffering from incontinence of urine as a consequence. But before she received my letter, advising her to return to me, she had already regained the control, and has continued well, as I have been informed within a few months.

The result in this case is unique, and while it may be seldom that the same procedure could be adopted with safety, several important and practical lessons are to be drawn from it. There are many conditions of the bladder where it would be good practice to lay open the septum freely, as was done in this case, and by means of the two instruments form a clear diagnosis and apply the necessary treatment. No other single fact is more clearly established than that such an incision will rapidly close up, or at least to a small opening, if the edges are kept clean, and the case properly managed. Should there be no special indication for keeping the incision open, the sutures can be introduced, and the whole line readily closed immediately after making the examination. I, however, do not advocate this procedure in private practice, when it is always difficult to secure to the patient the proper after-treatment. The operation can never be a simple or promising one except under the most favorable circumstances.

Before entering the bladder, in the case I have last cited, I had determined to close the opening from the old abscess if the ureter were found pervious. In this case there was no occasion for doing so, as the canal had to be used for the passage of the urine into the bladder. But I saw that it was feasible to close such an opening within the bladder, as readily as if situated in the upper portion of the vagina. The cases are not rare where, after a pelvic abscess, feces and flatus have continued to pass into the bladder, or urine into the vagina or rectum, long after the original condition has disappeared. I am now satisfied that the bladder end of an opening in these cases can be closed within that cavity and with safety, since there must always be the remains of thickened tissue behind it to receive the suture. I am, moreover, the more confident, from my knowledge of the fact that women, in comparison with men, bear such operations well. It is a provision of nature that the female bladder is very tolerant to injury, or the dangers of parturition would be far greater. There is no comparison between the sexes as to this degree of tolerance; a man would lose his life were he subjected to certain procedures or injuries that cause little irritation in a woman.

Congenital defects in the position of the mouth of the ureters are very rare. I have seen but one case in which the opening of the ureter into the vagina existed from birth. Dr. William H. Baker, of Boston, a former house surgeon in the Woman's Hospital, has cured such a case, where the ureter came out near the meatus of the urethra. At my suggestion he dissected up a portion of the end of this ureter, made an opening under its course, near the neck of the bladder, then turned the stump down into the opening, and closed the vaginal surface over it. The result was a success, and there is no similar case, to my knowledge, on record.

I contemplated a somewhat like procedure in my case for leading the urine into the bladder. As the mouth of the ureter presented just on a line with the os uteri, I could not, of course, dissect up any portion of the canal, nor could I have entered the bladder at this point with safety. I, therefore, determined to make a canal along the vaginal surface until I reached the base of the bladder, where the septum was thinnest and the two cavities in the closest relation. Then I intended to remove a small portion from the septum, just in front of where the false passage terminated, and, after the sides of this had healed, to cover the vaginal end with a flap dissected up and turned for the purpose. I succeeded in forming a canal, as a new urethra would be made, by turning over together the vaginal tissue, and it extended from the mouth of the ureter to the point at which I intended to enter the bladder. At this stage, during a temporary visit home for a few months, the patient died from an attack of pneumonia : at least I judged it to be pneumonia from the statement of her friends.

About a year after the operation, in Dr. Baker's case, it was necessary to open the bladder again for the removal of a large stone. This was doubtless formed, as is frequently the case, from a raw surface exposed in the bladder, on which a phosphatic deposit will sometimes take place with great rapidity. The practical lesson taught by this case is the necessity for dissecting up at a previous operation the portion of the canal to be turned into the bladder ; and that the surfaces should be allowed to heal over before they are turned into the bladder.

Dr. Theophilus Parvin, of Indianapolis, was the first to place on record,[1] and to describe this condition as a primary lesion, the result of labor and not as a consequence of an attempt to close a vesico-vaginal fistula. In Dr. Parvin's case the opening was situated in front of the uterus, and so near the median line that it could not be determined which ureter was involved until a probe had been introduced. The fistula had existed for 14 years, and was the result of the ninth labor at 40 years of age. Delivery was effected by means of the perforator and with the aid of the blunt hook. She was confined to her bed for several weeks, but after recovering her strength, the menstrual period never returned.

The cervix was destroyed by a slough, which must have done even more damage to the uterus from the absence of menstruation afterwards. It was evident that the slough extended on the vaginal surface, and into the deeper tissues to involve the ureter. As this surface contracted, the opening into the ureter remained, and was drawn towards the median line.

The success of the final operation was a surgical triumph when we appreciate the difficulties of such a case, and the fact that, even at so recent a date, the profession was in possession of a very limited practical knowledge of this operation under any circumstances.

7. *Openings into the rectum from the vagina.* For all practical purposes we might confine the consideration of this special injury to the effects of childbirth. I will, however, briefly refer to other cases,

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[1] The Western Journal of Medicine, Indianapolis, Oct. 1867.

such as cancerous ulceration and syphilitic abscess. When cancer has advanced so far as to involve the bladder or rectum, nothing can be done to repair the injury. There remains no course of treatment beyond close attention to cleanliness, and an effort to make the patient as comfortable as possible.

We meet with cases of recto-vaginal fistula where, at first sight, it is difficult to determine the cause. The difficulty will be all the greater, should the patient have had syphilis, as she would probably be anxious to conceal the fact.

The coexistence of syphilis with the injury is a most important matter for the surgeon to determine, since no benefit can be expected from any procedure of a plastic character, about the vagina, when the parts have been destroyed by syphilitic sloughing. Generally, sloughing first takes place about the urethra or neck of the bladder, and the rectal difficulty occurs later, being produced by the discharge finding its way into the anus, where it excites inflammation which results in the formation of abscess between the rectal and vaginal walls. The abscess opens into the vagina, generally just behind the sphincter ani muscle, the opening into the rectum being usually oblique and complicated by stricture, to a greater or less degree, in front of it.

So far as my observation has extended, I may state that the presence of a stricture just within the anus is always a probable evidence, if not positive proof, of syphilis. Cancer may extend from above and produce a stricture at the same point, but when this occurs there can be no room for doubt that the disease is cancer, and the stricture will be found to involve the whole rectum.

When a recto-vaginal fistula is situated directly against the sphincter it is always difficult to obtain good union, in consequence of constant contractions of the muscle. In such a case it is necessary to divide the perineum and sphincter directly through to the fistula with a pair of scissors. The sides of the fistula should be freshened, and the case treated as if a laceration through the perineum had occurred, this being the only plan by which we can be certain that the edges have been thoroughly denuded. Should the operation partially fail, a second one would be successful. But if the parts be thus divided through tissues which have undergone more or less syphilitic sloughing, the condition of the patient will have been rendered infinitely worse; I have never succeeded in obtaining union in the sphincter and perineum of such a case.

I would recommend a thorough course of constitutional treatment before any operation is attempted, and that the stricture be first removed before an effort is made to close the fistula by any method; otherwise, its situation will force the flatus in the direction of the fistula, if it shall have been closed, and cause it to find exit between the sutures.

To close a recto-vaginal fistula, from the vaginal side, is always more difficult than it is for one opening into the bladder. The difficulty arises from the limited means we have at command for bringing the parts into view without dragging them down.

For an examination, it is necessary to have the patient on the back with the legs flexed over the abdomen, and to employ Sims's speculum placed under the arch of the pubes, and a tractor held on each side by an assistant, if necessary, to bring the parts into view. If the patient be anæsthetized, the sphincter can be moderately stretched, before placing the woman on the left side, then with a speculum in the rectum, the fistula can be readily brought into view. Before making such an examination it is always best to wash out the rectum by an enema, and it will add greatly to the comfort of the operation to have a large dressing sponge, with a string attached to it, placed well up at the sigmoid flexure.

A recto-vaginal opening is generally much larger on its vaginal than on its rectal aspect. Its edges are bevelled, and as a rule are more difficult to be brought into apposition. Consequently, freeing the edges is a more essential feature of the preparatory treatment than it is with a vesico-vaginal fistula. Whenever the edges of a rectal fistula can be brought together, the subsequent steps of the operation are essentially the same as for vesico-vaginal fistula, and the extent to which the tissues are to be divided is to be estimated in the same manner, by tentative traction with the tenaculum.

Cases are met with occasionally when no extent of division of tissue on the vaginal surface will permit of the edges being brought together.

If traction is tried in such a case it will be at once demonstrated that the parts are no longer drawn up into folds, but that the vaginal and rectal walls are firmly adherent. In such a case it is necessary to split the edges of the fistula on each side to a depth sufficient to permit the edges of the rectal wall to be brought together below, leaving the vaginal opening to be filled up by granulations. Narrowing of the rectum would seem to be an inevitable consequence of this method, but the rectal tissues are so elastic that no appreciable constriction follows this procedure.

On May 28, 1870, I closed a recto-urethral fistula in a gentleman from Kentucky, at the request of the late Dr. J. C. Nott. The case was reported[1] but without giving the operation in detail, and I now give it in full, as it seems well to illustrate the manner of closing from the rectum similar openings in the female organs.

"On the 1st of December, 1868, a large stone of irregular shape, weighing five ounces, was removed by the lateral operation, which left a fistulous opening in the rectum, through which the urine passed." "A portion of the urine continued to discharge by the rectum up to the time of his arrival in New York, and no attempt has been made to close the opening. Not only did a portion of the urine pass through the rectum, but fecal matter and gas frequently escaped with the urine through the urethra. The feces sometimes formed an annoying temporary obstruction to the passage of the urine through the penis. The bladder was irritable, requiring the urine to be passed off more frequently than natural. The rectum was also irritable, but less so than is usual in urinary fistulæ opening into it." I had no opportunity of examining the case until called upon to operate. When the parts were brought into view by placing my self-retaining speculum in the rectum, two oval openings were seen about an inch apart, one leading into the bladder and the other to the urethra.

Between these openings a narrow strip of urethral mucous membrane could be traced, which represented all that remained of the membranous portion of the urethra. The appearance was as if a section had been removed, such as would be presented by a large quill from which a segment had been removed by a sharp knife, so as to leave a small narrow portion in the centre. The facility with which I succeeded in closing this opening, by supplying the loss from rectal tissue, led me subsequently to employ the same method for closing certain cases of recto-vaginal fistula. The rectum in this neighborhood forms a double concave surface, due to its direction, its long diameter, and its cylindrical shape.

On a correct appreciation of this fact rested the success of this operation. I soon ascertained, by experimenting with a tenaculum, that, if I should denude a portion of rectal surface of a uniform width, in two parallel lines, from one opening to the other, I would not be successful in forming a urethral canal. This, doubtless, was the most obvious mode of procedure, and yet it was evident that if these freshened surfaces were turned over and brought in contact, there would result a narrowing in the centre in the shape of an hour-glass contraction. In order, therefore, to reconstruct the membranous portion of the urethra in this case, it was necessary to remove the mucous membrane from the rectal surface in the form of an elliptical space, as shown in diagram Fig. 116. Four of the sutures are there represented to have been introduced for the purpose of showing that when these were tied the undenuded spaces *A B*, Fig. 116, would form a canal of uniform width, and the line of union would lie in the direction *C D* in the long axis. Now Fig. 117 is supposed to represent a recto-vaginal fistula viewed from the rectum. The mucous membrane of the rectal surface is shown to be denuded in an elliptical form, as in Fig. 116, but with the long diameter of the ellipse crosswise.

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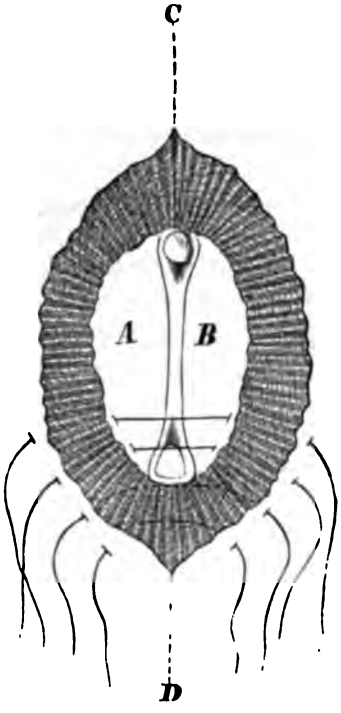
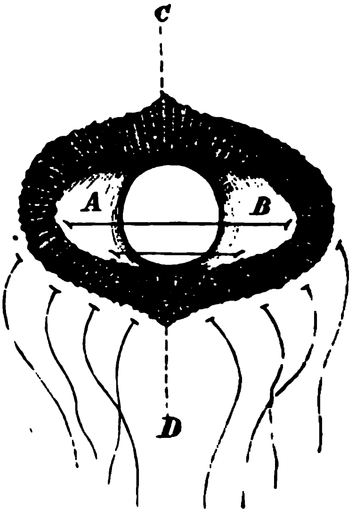
[1] Case of Recto-urethral Fistula, by J. C. Nott, M.D.; N.Y. Med. Journ., Sept. 1870.

Fig. 116.



Recto-urethral fistula in a man (from the rectum).

Fig. 117.



Recto-vaginal fistula (rectal surface).

The direction of the ellipse, represented in Fig. 116, was demanded by the necessities of this special case, and is exceptional. With a circular rectal fistula the ellipse should always extend across the long diameter of the rectum, as shown in Fig. 117, in which the sutures are represented as introduced in the same manner as in the preceding figure. It is evident that in Fig. 117 the two surfaces *A B* would be turned over and become a portion of the vaginal surface when the sutures were secured in the line *C D*. Care must be exercised to bend the sutures properly, so that they shall lie flat to the rectal surface with their free end directed somewhat towards the outlet, so as to avoid catching portions of fecal matter, which would prove a source of irritation. Moveover, bending their ends in this direction permits the sponge which had been placed at the sigmoid flexure to be withdrawn without disturbing their position. The sutures should remain about eight days, and no special means need be taken to constipate the bowels beyond the use of some form of concentrated food which furnishes little residual matter. If the rectum be found occupied by feces when about to remove the sutures, the mass must be carefully sponged or washed away with a jet of water from a syringe, sufficiently to bring the sutures into view. If the desire to have the bowels moved had been urgent previous to this time, a dose of medicine administered for the purpose would be safer than to distend the rectum with an enema.

This method of closing a fistula from the rectal side is only applicable to such as are of moderate size with the edges bevelled in the opposite direction, showing the destruction of tissue to have been greatest on the vaginal surface. Whenever the sides of the fistula can be brought together, the opening should always be closed from the vagina. This is the simplest of the two methods, and the one most likely to be successful, since there is more danger from hemorrhage, and the sutures are more liable to cut out from rectal than from the vaginal tissue. By making an incision on each side of the opening, parallel to the axis of the canal, the edges of a fistula may often be made to drop easily together on the vaginal surface, and without subsequent tension, even in unpromising cases.

I have seen several cases where, during parturition, the child's head had been left pressing on the perineum so long that a circular slough was thrown off, destroying the neck of the bladder, part of the urethra, and leaving a rectal fistula just behind the sphincter ani. After such extensive sloughing a cicatricial band sometimes forms around the vaginal outlet and across the remains of the urethra. In these cases, although it may be easy to bring the vesico-vaginal fistula into view and to close it, the rectal one is situated so close behind this band that, unless it be divided, it is sometimes impossible to bring the opening into view. This, however, must not be cut, for the neck of the bladder is lost, and there remains only the traction from this band to furnish the retentive power, which it does by keeping the sides of the urethra in close contact. In such a case the opening must be closed from the rectum, or, if this be impossible, reliance must be placed on the sense of touch to accomplish it from the vaginal side. I was obliged in one case,[1] through fear of loss of the retentive power, to close such an opening, and succeeded in freshening the edges and in securing the sutures without once seeing the fistula.

8. *Vesico-vaginal fistulæ from accidental causes.* Under this head it will not be necessary to present more than the history of two cases which cannot be classified elsewhere. The occurrence of the accident from pelvic abscess, and from calculi cutting through into the vagina from the bladder, will be treated of later.

Case XLVIII.—A vesico-vaginal fistula behind the left ramus, caused by pressure of a pessary which had been worn for five years.

Miss M., aged 47, from Rush, N. Y., consulted me May 19, 1866. She came under the observation of Dr. Hammond, of her neighborhood, some two years before, in consequence of incontinence of urine, from which she had begun to suffer a short time previous. He removed from the vagina a corroded "horse-shoe" pessary, one limb of which had entered the bladder. She had been ignorant of the fact that any instrument had ever been introduced, and had not been examined for over five years previous to its removal. An attempt was made to close the opening by the use of caustic, but without success. The doctor then operated, but succeeded only partially, and recommended her afterwards to consult me.

An opening, through which a No. 12 bougie could be easily passed, was found situated behind the left ramus at the bottom of the sulcus formed on that side between the lateral wall and the base of the bladder. The edges of the fistula were thin and tense, being formed entirely of cicatricial tissue, and to this condition the failure of the operation was doubtless due.

May 22. The opening was closed by nine sutures. It was evident that no union could be obtained by bringing together the cicatricial edges of the fistula, nor could this tissue be removed bodily, in consequence of the locality being in close proximity to the large vessels running along the sulcus. Under the circumstances the vaginal surface on each side of the sulcus was freshened in either direction, at some distance from the opening, but as near the edge as possible without including the cicatricial tissue. The surface, when thus denuded, represented a long oval, about an inch and a half in length, and less than an inch in width. As the sutures were twisted, a fold of the lateral wall was doubled down over to the base of the bladder. This inclosed the fistula in a long pouch below, but from the position and shape of the cavity it was impossible for a drop of urine to remain after the bladder had been emptied.

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[1] See Case No. 167 of Abstract of Cases of Fistula, in this work (Case LXVII. in my book on Vesico-Vaginal Fistula).

June 1. Five sutures were removed, but the others not until June 9, as the tension exerted by bringing the surfaces together was sufficient to make it advisable that they should remain longer.

12*th*. She sat up, and on the 19th inst. she returned home, cured.

Case XLIX.—Vesico-vaginal fistula, resulting from a pistol-ball which entered the thigh and passed from the vagina through the bladder and abdomen; no union after the first and second operation, from the occurrence of cystitis. Third operation successful.

Miss H., aged 25, was admitted to the Woman's Hospital, from Virginia, Nov. 8, 1866, with the following history. In March, 1865, while resisting the attempt of a soldier to buckle a holster of pistols around her waist, a navy revolver fell out, and on striking the floor, it was discharged with the muzzle upward. As a number of persons were in the room at the time, she did not inform her friends that she had been injured, and the fact was not known until she fainted from loss of blood.

On examination it was ascertained that the ball had entered the right thigh, and passing into the body, was found lodged immediately under the skin on the left side just above the crest of the ilium. She was confined to her bed for five weeks, during which time the track of the ball through the thigh healed, but with incontinence of urine remaining. Several months afterward Dr. Fisher, of Warrenton, Va., operated for the purpose of closing the vesico-vaginal fistula, but without success, in consequence of the condition of the bladder and the cicatricial edges of the opening.

I found the point of entrance into the right thigh was about five inches below Poupart's ligament, and two inches outside of the femoral artery. The ball had crossed the course of the artery and entered the pelvis and the vagina, apparently through the thyroid foramen, thence obliquely into the bladder, perforating its base in the median line, about midway between the neck and cervix uteri. After examining the bladder carefully with a sound, quite a prominent fold, or ridge, was felt on its posterior wall, stretching across the cavity just above the line of peritoneal reflection from the bladder to the uterus. It was, therefore, evident that the ball had escaped from the bladder at this point into the peritoneal cavity, and striking the uterus obliquely below the fundus had glanced off nearly at a right angle, and, passing among the intestines, lodged under the skin just below the crest of the ilium on the left side. The fistula was nearly circular, and still large enough to admit the first joint of the index finger. Its edges were tense and formed of cicatricial tissue extending to some distance from the opening.

It was evident that at the time of the accident, the bladder contained but a small quantity of urine; it was immediately emptied, evident. It was directed that the bladder should be washed out carefully several times a day until after the next period. A large quantity of warm water was used, the catheter being introduced through the urethra, and the fluid escaped through the fistula into the vagina.

May 25. It was thought that her condition had improved sufficiently to justify another operation, which was performed under the influence of an anæsthetic in the following manner. A point, somewhat in advance of the old line of union, was seized with a tenaculum, and, with scissors, the cicatricial tissue was removed in a single piece, about three-quarters of an inch wide, so as to include the entire length of the vaginal fistula. The opening into the bladder itself was not enlarged, but as much of the vaginal tissue as possible was removed through the opening. A practical point was involved in not touching the mucous membrane of the bladder; but as regards the value of this a difference of opinion exists. (When the vesical surface is included in the denudation I am quite sure that the risk of hemorrhage is increased, and the mucous membrane tends to retract from the edges of the vaginal tissue, thus rendering the effective introduction of sutures very difficult, unless they are passed within the bladder.) A nucleus is thus frequently furnished for the formation of a calculus, and often the bladder becomes so distended with a clot, as to render it necessary to remove the sutures to arrest the bleeding. I have already referred to a fatal termination in the Woman's Hospital from this cause.

To relieve all tension, the edges of the fistula on each side were put on the stretch by a tenaculum, and snipped with scissors in a parallel line along the vaginal tissue, somewhat longer than the opening, and about half an inch from its borders. Eleven interrupted silver sutures were introduced farther back than usual from the edges, so as to include a fair portion of tissue, and the line, when secured, was about an inch and a half in length.

A smaller number of sutures were required in this operation, although the opening had been made larger. This was due to its oblong shape, which allowed its edges to close naturally together, while the former, being circular, could not have been closed without forming on the vaginal surface a puckering fold at each extremity. To obviate this condition, it was necessary to remove a portion of the vaginal tissue at some distance beyond each end, and to include the extended line in the sutures, as already explained, until the fold was smoothed down to the general line of the vagina.

The operation was finished in about three-quarters of an hour, and with but little bleeding, as the scissors had been used. After the bowels had been opened by a mild cathartic the night before, the sutures were removed on the tenth day. Two days afterwards she sat up, and returned home, cured, June 18.

CHAPTER XXXIII.

STATISTICAL HISTORY OF VESICO- AND RECTO-VAGINAL FISTULA.

I HAVE had nearly four hundred cases of vesico-vaginal fistula under my care, in public and private practice, but unfortunately the records of the greater portion of these are not available.

The twenty-second annual report of the Woman's Hospital contains a tabular statement, as it is supposed to be, of all the diseases which had been treated in the institution from its organization in April, 1855, to the end of the year 1875. This report was prepared by Dr. John A. Beekman, one of the pathologists of the institution, and from his notes I have been furnished with the material which will be presented on this subject.

It is stated that two hundred and eighty-nine cases of vesico- and recto-vaginal fistula, resulting from parturition, had been treated in the institution during the above given period.

This number, I am confident, contains all the cases which had been operated on by the other surgeons, who have been connected with the hospital. Dr. Sims's record I kept myself, and the histories of the cases operated on by the members of the Medical Board, since the change of organization in 1872, are complete. But the first records of a portion of the cases which were treated by me were never copied into the case book, and so were lost; and I have been able to establish the fact that the records of at least fifty-seven cases of fistula are missing, on account of the unsettled condition of affairs in the institution previous to the removal of the patients into the new building.

Dr. Beekman furnished me with outline histories of the cases on which I operated after Sept. 1, 1862, when I took charge of the institution, and as the record thus stands, I have treated nearly sixty per cent. of all the cases. But Dr. Beekman's list does not include those of which the records have been lost, nor any case which had been admitted during the time of Dr. Sims's service, but treated by me. An important number of cases have been also excluded which had been but partially benefited, or had received but some preparatory treatment, during the above period, and yet years after they came under my care and were cured. These would not appear on the hospital books as new patients, but their records would be continued from the date of their first admission. Nor have I been credited with any case treated by me during the greater portion of the year I was in charge of the institution during Dr. Sims's absence in Europe, and previous to his departure. I believe that about eighty per cent. of all the cases which have been treated in the Woman's Hospital, previous to the making of this report, were under my charge.

To attempt the sifting of the records from the date of admission of each patient, for the purpose of separating those which had been under my care would have involved an almost impossible amount of personal labor, and was deemed unnecessary in view of the material already available, including only, as has been stated, the cases operated on by me after Sept. 1, 1862, to the date of the report. After this those still under treatment were excluded, although I believe all have been cured since that date. I shall also use any material needed which I may have already presented in my work on vesico-vaginal fistula. In private hospital I have treated a number of cases, but after they ceased to be a novelty, the record of the operation and after-treatment was not kept with accuracy, unless the case possessed unusual interest.

The causes are thus given for fistulæ opening into the vagina or rectum in such cases as were admitted to the Woman's Hospital under my care.

Childbirth	171
Syphilitic sloughing into the bladder	1
Cutting of a pessary into the bladder	1
Gunshot wound between the bladder and vagina	1
Sinus of an abscess opening into the bladder and vagina	1
Breaking of a glass syringe, which cut into the bladder	1
Accidental incised wounds	3
Removal of stone	7
Relief of cystitis	16
	202

The proportion is 5.84 per cent. for recto-vaginal fistula, where the lesion resulted from childbirth. For the present it is unnecessary to enter more into detail as to the above stated causes of fistula, unless to make some reference to those resulting from incised wounds. These cases were admitted to the hospital after they had received the accidental injury. In one, an attempt had been made to reach the uterus in a case of congenital absence of the vagina. The bladder was entered, and the case will be found detailed in the chapter on

TABLE LIII.—*Condensed History of cases of Vesico-Vaginal Fistula resulting from Childbirth.*

Number of the labor in which injured	1	2	3	4	5	6	7	8	9	10	11	15	No record.	Average.
Number of women	35	24	11	16	7	8	4	4	1	3	3	1	4	
Proportion for each labor	49.71	14.04	6.43	9.36	4.09	4.68	2.34	2.34	.58	1.75	1.75	.58	2.34	
Average time in labor, given in hours	67.34	49.69	39.88	45.00	44.66	54.25	41.25	65.50	42.00	59.66	54.66	133.00	....	58.61
No. of children born before the injury	93	53	34	65	35	48	29	32	9	30	35	15	....	2.79
No. of children born after the injury .	8	4	....	1	....	....	1	....	....	....	2	....		
Average age at the time of marriage .	23.33	24.52	22.84	23.92	22.14	21.42	19.00	18.50	26.00	21.66	17.66	18.00	....	22.90
Average age at the time of admission	28.44	31.26	32.27	32.00	35.85	32.55	31.75	34.50	40.00	46.33	43.00	44.00	....	31.24

"Absence of the vagina." In the second case a portion of the recto-vaginal septum had been cut through in an operation for vaginismus. In the third instance the bladder was opened in an attempt to divide cicatricial bands which partially closed the vagina.

I shall now confine myself to a consideration of this injury as the result of childbirth.

By Table LIII. it is shown that 171 women were injured from their first to their fifteenth labor, and the percentage for each labor is also indicated. The important fact is brought out that about half of all who suffer from this lesion are injured in the first labor, and that with each succeeding labor the liability is lessened. The average duration of labor, computed from rupture of the membranes, as the most certain indication that labor had begun, was 58.69 hours for the total number, and for the completion of the first labor this average is greater than for any other. The average age at the time of admission was 31.34 years, which is an indication that the injury is generally sustained at a comparatively early period of life. The average age of marriage as taken on the total number is not greatly in excess of the general average on all women. But for those who were injured in the first and second labors it is sufficiently in excess to indicate that the rather late marriage of a number of women may have some relation to the accident. We may interpret these averages to indicate that the first labor, without being at so advanced an age as to have seriously jeopardized the life of the woman, was, nevertheless, with many, sufficiently late to have caused the progress to be retarded through want of elasticity in the soft parts.

Only sixteen children were borne by all these women after the reception of the injury, and there were a few miscarriages. Although the average age of these women, when the fistula was formed, was comparatively early, yet they had then borne 478 children; and, although, as a rule, they were sterile afterwards, it is evident this condition was the result of the accident, since the average was already 2.79 children for each.

The number of women, mode of delivery, and average time in labor are shown in Table LIV., together with the percentage of those delivered by the different methods. About 46.19 per cent. were delivered by forceps, and their average duration of time in labor was 68.55 hours. These women were much longer in labor than those delivered by any other means, with a single exception, which is doubtless due to the comparatively small number of those terminated by traction after the head had been born and pains had ceased.

TABLE LIV.—*Nature of the Labor and Mode of Delivery from which Vesico-Vaginal Fistula resulted.*

No. of the labor in which injured		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	15.	No record.	Total number.	Average time in labor.	Per cent.
Delivered by forceps.	Number of women	41	12	6	8	3	2	1	2	....	1	3	....	......	79	......	46.19
	Average time in labor ...	82.41	50.08	43.00	53.37	63.00	68.50	17.00	84.00	....	60.00	54.66	....	......	......	68.55	
Ergot.	Number of women	3	....	....	1	....	....	....	....	....	2	....	....	......	6	......	3.27
	Average time in labor ...	67.66	....	....	44.00	....	....	....	....	....	59.50	....	....	......	......	61.00	
Ergot and forceps.	Number of women	3	1	....	1	....	....	....	1	1	....	....	....	......	7	......	4.09
	Average time in labor ...	42.00	48.00	....	....	....	....	....	60.00	42.00	....	....	....	......	......	46.00	
Craniotomy.	Number of women	9	1	....	....	....	3	1	....	....	....	....	....	......	14	......	8.18
	Average time in labor ...	48.57	49.00	....	....	....	70.00	48.00	....	....	....	....	....	......	......	53.91	
Version and craniotomy.	Number of women	....	1	....	....	1	....	....	....	....	....	....	....	......	2	......	1.16
	Average time in labor ...	....	28.00	....	....	17.00	....	....	....	....	....	....	....	......	......	22.50	
Version.	Number of women	....	....	....	1	1	1	....	....	....	....	....	....	......	3	......	1.75
	Average time in labor ...	....	....	....	1.00	8.10	18.00	....	....	....	....	....	....	......	......	9.00	
Version and forceps.	Number of women	1	....	1	....	....	....	....	....	....	....	....	....	......	2	......	1.16
	Average time in labor ...	44.00	....	48.00	....	....	....	....	....	....	....	....	....	......	......	46.00	
Embryotomy.	Number of women	2	....	....	....	....	....	....	....	....	....	....	....	......	2	......	1.16
	Average time in labor ...	23.50	....	....	....	....	....	....	....	....	....	....	....	......	......	23.50	
Traction.	Number of women	4	1	1	1	....	1	....	....	....	....	....	1	......	9	......	5.26
	Average time in labor ...	98.50	78.00	30.00	48.00	....	12.00	....	....	....	....	....	133.00	......	......	75.22	
By the unaided efforts of nature.	Number of women	17	6	2	4	1	1	2	1	....	....	....	....	......	34	......	19.88
	Average time in labor ...	45.82	46.50	31.50	34.75	58.00	48.00	50.00	31.00	....	....	....	....	......	......	44.44	
Manner of delivery not stated.	Number of women	5	2	1	....	1	....	....	....	....	....	....	....	4	13	......	7.00
	Average time in labor ..	57.33	48.00	....	....	....	....	..	..	....	....	..	..	......	......	55.00	
Total number		85	24	11	16	7	8	4	4	1	3	3	1	4	171	58.61	

Attention is particularly called to this fact, and its significance in reference to the popular belief that fistula is a result of instrumental delivery. It must also be noted how large a proportion of these cases were terminated by the unaided efforts of nature; and particularly that the average duration of labor was much less under this mode of delivery. Two exceptions will be noted where delivery took place in a much shorter period of time, but the number is too small to have any weight. The circumstance may be accepted as an indication that neither the occurrence nor extent of injury is due alone to the length of labor.

An explanation must be made in regard to what may seem, from a casual glance, to be an error in this table. Among the eighty-five women who received the injury in the first labor, there were three delivered by forceps and two by craniotomy, where the time in labor was not noted. The average duration of labor is taken on the real number, but the total one is given to avoid confusion.

If it were shown that medical men had been in charge of these women, the above table would indicate great neglect or ignorance. But for the credit of the profession, I am happy to state, my investigations on this point are most satisfactory. Whether the injury was sustained in Europe or in this country, but few women received medical care. The history of many shows that they were attended by irresponsible women, or had no one until at the last moment, when a regular practitioner was called in to effect the delivery. With but very few exceptions have I failed in tracing out some reasonable cause for the injury, where the case had been attended by a medical man throughout the progress of the labor. As the exceptions to the rule, however, some flagrant instances of gross neglect and of unpardonable ignorance were made evident.

Beyond question, in the majority of cases, a neglect to empty the bladder has, by retarding the progress of labor, proved an indirect cause of vesico-vaginal fistula.

Table LV. includes a certain number of cases where the bladder had been properly emptied throughout the time of labor. With others the bladder was not evacuated, and the average is given in hours for the length of time the retention existed. A few of these women were doubtful, from the fact that they suffered from puerperal fever, or were unconscious for a length of time, but the probabilities are all in favor of the supposition that retention existed. With a large number of cases no record was made on this point.

After looking over the averages, as given in Table LV., or if

TABLE LV.—*Vesico-Vaginal Fistula: Number of Operations required, considered in relation to the Condition of the Bladder during the Labor in which the injury happened.*

(Duration of labor in hours.)

No. of operations after injury		1.	2.	3.	4.	5.	7.	8.	10.	14.	20.	Not given.	Total number	Aver'ge time.	Per cent.
Bladder emptied regularly		13	8	3	2	2	....	....	....	....	....	....	28	....	16.37
Bladder not emptied.	No. of cases	30	10	....	1	....	....	....	....	1	1	2	45	....	26.31
	Av. duration of labor	58.90	67.80	....	26.00	....	....	....	....	24.00	34.00	23.50	....	57.24	
Doubtful.	No. of cases	3	1	....	1	....	....	....	....	....	....	....	5	....	2.92
	Av. duration of labor	109.60	48.00	....	72.00	....	....	....	....	....	....	....	....	89.40	
Not mentioned		34	20	11	2	1	1	1	1	1	....	1	93	....	54.37

TABLE LVI.—*Vesico-Vaginal Fistula: Number of Operations required, considered in relation to the Time at which Urine began to escape through the Fistula.*

(Average time after delivery in days.)

No. of operations after injury		1.	2.	3.	4.	5.	7.	8.	10.	14.	20.	Not given.	Total number	Aver'ge time.	Per cent.
No. where urine escaped from time of delivery		18	18	9	1	1	....	1	1	1	....	....	50	....	29.24
Escaped after delivery.	No. of cases	51	12	2	1	2	....	....	....	1	....	1	70	....	40.93
	Average time after	11.80	9.00	10.00	4.00	5.00	....	....	....	3.00	....	2.00	....	10.79	
No. of cases where no statement was made		31	9	3	4	....	1	....	....	....	1	2	51	....	29.82

the time of retention be noted, one can but be astonished at the capacity of the female bladder. The statement so often given that "the urine escaped as soon as the head was delivered by the forceps" is not necessarily an indication of harm done by the instrument, but conclusive evidence of neglect on the part of the operator to empty the bladder. While no special harm may accrue to the mother from this neglect, it is evident that the life of the child is placed more in jeopardy by the delay and increased difficulty of delivery, on account of the space occupied by an over-distended bladder. The object of Table LV. is to draw attention to the condition of this viscus. So far as stated the figures are reliable, but cannot be accepted as an indication of the frequency with which urine is allowed to accumulate. In nearly every instance, as given in the table, when any positive information was obtained, I had made the record myself, and, excluding the 93 cases in which my assistants neglected to obtain information in regard to this matter, it seems probable that in at least half of the cases the bladder was not emptied during the progress of the labor. This proportion even is very likely under the average.

In Table LVI., it is shown that with a large proportion of cases, there was no loss of urine for days after delivery. It is evident, therefore, that death of the soft parts takes place, forming a slough, which requires a certain time before it can become separated from the healthy tissue. This impresses me with the belief that if the bladder were always evacuated before delivery, the loss of urine would only occur after a slough had come away, and never at the time of delivery, unless there were a laceration. It is not improbable that even the extent of sloughing might be greatly limited by measures to remove the additional source of irritation.

It is shown in Table LVI. that with 29.24 per cent. the urine escaped from the moment of delivery. With 40.93 per cent., the loss of urine did not take place for a long period after termination of the labor. While in 51 cases, or 29.82 per cent., it was neglected to make any record.

After further investigation, the proportion may vary somewhat as to the number of cases with escape of urine at birth, or after a certain time. But the average here shown in seventy cases, as to the separation of the slough after the tenth day, is likely, since from so large a number, to be a near approach to the rule.

If the testimony of these women can be relied upon, as to the frequent neglect to use the catheter before resorting to instrumental delivery, the question would naturally present itself as to cause and effect. The average time is so long before the separation of the slough takes place, that it is not improbable, with many cases, the exciting cause of the inflammation, which ends in sloughing, had its origin in the additional force necessary to effect the delivery, while the bladder was over-distended.

That so well-known a necessity should be neglected, before attempting the operation of artificial delivery, seems almost incredible. But I find this omission was quite as common abroad as in this country, and by a class of men who would never have neglected such a precaution in private practice. The only explanation, if it can be accepted as one, is the hasty rendering of often a gratuitous service, with no previous responsibility of the case, and with the single purpose of accomplishing the delivery with the least loss of time. We must also bear in mind how frequently women of this class will mislead us through their lack of intelligence. Moreover, after impaction takes place a woman is often able only partially to empty the bladder by her own exertions, and may deceive herself as to its true condition. Therefore, there can be but one safe course to pursue, and that is the introduction of a male catheter, or an elastic one in every case, without any regard to the statement of the patient.

But under some conditions the head may so fill up the pelvis as to render the introduction of the catheter an impossibility, unless such force be employed as might cause a false passage or lead to inflammation of the urethra. If the forceps can be applied this difficulty may be easily overcome, as the head may be lifted up or turned to one side sufficiently to admit of the introduction of a catheter. Delivery should, therefore, never be attempted until after the bladder has been emptied, since the child would be likely to be lost and the neck of the bladder lacerated. Should it be impossible to apply the forceps or to introduce the catheter, the bladder must be aspirated. This operation has been frequently performed on the male, by passing a fine trocar just above the pubes, so as to enter the bladder below the dip of the peritoneum, and it has been done without the slightest bad consequences. I should hold this to be the proper course of treatment so long, at least, as the child was alive, and, even if craniotomy should be performed afterwards, the space thus gained, by emptying the bladder, would prove advantageous. But we have no right to sacrifice the life of the child, even if the mother be in danger, so long as there is a possibility of saving both with little increase of risk to the mother. Therefore, the bladder must be emptied first, and before the next step can be decided upon. The progress of labor is frequently retarded, and even arrested, by a distended bladder, yet delivery often takes place promptly through the efforts of nature alone after the accumulation has been removed.

In Table LVI. the condition of the bladder, in regard to the retention of urine and the time of the separation of the slough, is shown in connection with the number of operations required afterwards to remedy the injury. It would be a difficult point to establish that the number of operations bears any relation to the duration of the retention, since so large a proportion of cases, it will be seen, are thus cured by one operation, without any regard to the actual loss of tissue. The retention of urine, as has been suggested, might, at the time of delivery, necessitate a resort to great force, liable to be followed by bad consequences. But, in all probability, the mere retention itself would not lead to extensive injury. The force would be directed chiefly against the neck of the bladder, when a laceration might occur, if a slough did not; but the danger of extension of the injury would cease as soon as the slightest opening took place.

Having considered the value of an over distended bladder as a factor in the production of vesico-vaginal fistula, with the degree of proportionate injury to the retentive power, we naturally pass to the study of the different modes of delivery as employed after greater or less delay.

The facts recorded in Table LVII. evidently show that instrumental delivery has but little to do with the formation of fistula. At the first glance it would appear that the extent of injury was due to the time of labor. This seems to be shown on taking, for instance, those delivered by forceps, where the time in labor is increased and the number of operations greater. It may be true that, under certain circumstances, the longer a woman is allowed to remain undelivered, the greater will be the risk of extensive injury to the soft parts. But, as a rule, it is a matter of doubt whether the extent of injury bears any relation whatever to the length of labor. This will be made evident after the most casual examination of the "abstract table of cases of vesico-vaginal fistula." Beginning with the first one of the record, where labor lasted but twenty-four hours, the result was such a destruction of tissue as to require twenty operations and three years of treatment to complete the restoration. Case No. 76 was in labor but eight hours and a half, and yet the sloughing was very extensive. On the other hand, Case No. 148 is shown to have been undelivered eight days, yet sustained comparatively slight damage; and so other cases might be cited.

TABLE LVII.—*Vesico-Vaginal Fistula: Mode of Delivery, Hours in Labor; No. of Operations required, Results.*

Number of operations............		1.	2.	3.	4.	5.	7.	8.	10.	14.	20.	Not given.	Cured.	Improved.	Not improved.	Died.	Result not given.	Total number.
Delivered with forceps.	No. of cases........	47	18	6	2	2	....	1	....	1	....	2	70	5	1	....	3	79
	Hours in labor.....	62.65	74.00	85.20	48.00	150.00	....	96.00	....	92.00	....	30.00	69 29	85.50	48.00	....	33.00	68.55
Ergot.	No. of cases........	3	1	1	....	....	....	....	....	....	1	....	6	...	....	....	....	6
	Hours in labor.....	79.00	81.00	24.00	....	....	....	....	....	....	24.00	....	61.66	....	....	....	....	61.66
Ergot and forceps.	No. of cases........	4	3	....	....	....	....	....	....	....	....	....	7	....	....	....	....	7
	Hours in labor	53.00	39.00	....	....	....	....	....	....	....	....	....	46.00	....	....	....	....	46 00
Craniotomy.	No. of cases........	10	3	1	....	....	....	....	....	....	....	....	11	2	....	1	....	14
	Hours in labor.....	49.25	64.33	60.00	....	....	....	....	....	....	....	....	47.77	57.00	....	103.00	....	62.25
Version and craniotomy.	No. of cases........	2	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	2
	Hours in labor.....	22.50	....	....	....	....	....	....	....	....	....	....	22.50	....	....	....	....	22.50
Version.	No. of cases........	2	1	....	....	....	....	....	....	....	....	....	3	....	....	....	....	3
	Hours in labor	13.00	1.00	....	....	....	....	....	....	....	....	....	9.00	....	....	....	....	9.00
Version and forceps.	No. of cases........	....	....	1	1	....	....	....	....	....	....	....	1	....	1	....	....	2
	Hours in labor.....	....	....	48.00	44.00	....	....	....	....	....	....	....	48.00	....	44.00	....	....	46.00
Embryotomy.	No. of cases........	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	2	2
	Hours in labor.....	....	27.00	....	....	....	....	....	....	....	....	20.00	...	....	....	....	23.50	23.50
Traction.	No. of cases........	5	3	....	....	1	....	....	....	....	....	....	9	....	....	....	....	9
	Hours in labor.....	97.00	60.00	....	....	30.00	....	....	....	....	....	....	77.22	....	....	....	....	77.22
By the unaided efforts of nature.	No. of cases........	21	6	3	2	....	....	....	1	1	....	....	27	4	2	....	1	34
	Hours in labor.....	42.81	62.33	27.00	30.00	..	....	....	48.00	48.00	....	....	50.91	30.00	26.00	....	48.00	44.44
Mode of delivery not stated.	No. of cases........	6	3	2	1	....	1	....	....	....	....	....	13	....	....	....	....	13
	Hours in labor.....	....	48.00	96.00	26.00	...	50.00	....	....	....	....	....	63.00	...	....	....	....	63.00
Total number for each operation		100	39	14	6	3	1	1	1	2	1	3	140	11	4	1	0	171

To establish, beyond question, the effect of instrumental delivery in these cases is a most important matter from a medico-legal point of view, since suits for malpractice have been instituted on the plea of damage sustained through want of dexterity on the part of the attending physician. A plea of this sort has been successfully prosecuted, proof being advanced that the urine escaped only at the moment of delivery, and, although the evidence might be conclusive to a jury, there exists, in reality, no connection whatever between the supposed cause and effect.

The damage is usually inflicted by the impaction of the child's head causing an obliteration of the circulation in the soft parts of the mother. Half an hour of this obstruction may cause the most extensive loss from sloughing. When the urine escaped at the moment of delivery, the damage, with scarcely an exception to the rule, had already been done, and a slough formed, which became loosened only as the head was withdrawn.

I do not hesitate to state that I have never met with a case of vesico-vaginal fistula, which, without doubt, could be shown to have resulted from instrumental delivery. On the contrary, the entire weight of evidence is conclusive in proving that the injury is a consequence of delay in delivery.

Since the loss is not in proportion to the length of the labor, as has been stated, and we cannot judge of the degree of impaction, there is but one safe course to adopt, and that is to effect a speedy delivery. I have for years taught, that so long as the head recedes after a pain the patient can be in little danger, notwithstanding the time of labor may have been prolonged. The jeopardy to the patient begins from the moment when the head becomes stationary, and then the child should be removed as speedily as possible. Just as the head leaves the uterus and while the neck is still grasped, there will of course be no recession for the moment. But the head in this condition is too low to cause damage at the superior strait, and has not yet reached the inferior one. The rule then is applicable when the head and shoulders have already escaped from the uterus, and the presenting part has begun to touch the floor of the pelvis. At this stage, when the head no longer recedes after each pain it is proof positive that the soft parts of the mother have lost their natural resiliency, and that delivery must be brought about speedily.

I do not pretend to lay down a fast rule for the experienced obstetrician as to the earliest period at which it is advisable to effect delivery, nor do I wish to advocate a more frequent use of instruments. These points must be determined by the attending physician in each case. But it is well to establish some general rule for the guidance of those whose experience is more limited, and I believe the indications above presented will be found to be applicable in a large majority of cases of protracted parturition.

TABLE LVIII.—*Mode of Delivery, Time under Treatment, and Result.*

Mode of delivery.		Cured.	Improved.	Not Improved.	Died.	Result not known.	Total number.
By forceps.	Number of cases	67	5	1	....	1	74
	Av. time under treatment (weeks)	16.82	23.30	5.00	....	4.00	[illegible]
Ergot.	Number of cases	6	....	....	....	....	6
	Av. time under treatment (weeks)	34.83	....	....	....	....	34.83
Ergot and forceps.	Number of cases	7	....	....	....	....	7
	Av. time under treatment (weeks)	12.42	.	....	....	....	12.42
Craniotomy.	Number of cases	11	2	....	1	....	14
	Av. time under treatment (weeks)	14.45	16.00	....	6.00	....	14.07
Version and craniotomy.	Number of cases	2	....	....	....	....	2
	Av. time under treatment (weeks)	9.00	....	....	....	....	9.0
Version.	Number of cases	3	....	....	....	....	3
	Av. time under treatment (weeks)	7.33	....	....	....	....	7.33
Version and forceps.	Number of cases	1	....	....	....	....	1
	Av. time under treatment (weeks)	36.00	....	....	....	....	36.00
Traction.	Number of cases	9	....	....	....	....	9
	Av. time under treatment (weeks)	8.33	....	....	....	....	8.33
Efforts of nature	Number of cases	27	2	2	....	1	32
	Av. time under treatment (weeks)	19.63	34.00	4.00	....	75.00	21.37
Mode of delivery not given.	Number of cases	13	....	....	....	....	13
	Av. time under treatment (weeks)	14.92	....	....	....	....	14.92
Total result of treatment		143	9	3	1	2	161

I have claimed that any one who is familiar with the mechanism of labor, although wanting in practical experience, would do less damage in applying the forceps in such a case than would result if the delivery were left unaided. It will be shown that the women who were delivered by means of instruments, after impaction of the head, sustained far less damage to the soft parts than those in whom labor was hastened by ergot, or terminated by the unaided efforts of nature. By reference again to Table LVII. it will be seen that the average duration of labor for those women who were delivered by instruments was greater than that of those in which the delivery was left to nature. The number is greater for the primipara; in fact nearly two-thirds of all the injuries occurred in the first labor. It is also shown that those labors in which forceps were used were nearly three times as long as those in which no aid was rendered. From so great a difference in the average duration of labor for the two classes of cases, it would be natural to suppose that the destruction of tissue would be comparatively slight, and the time under treatment less for those who were delivered without aid. It is not within my province to enter into a discussion of the relative advantages of forceps and of the unaided efforts of nature for terminating tedious labors. But the fact cannot be questioned, nor can it be reiterated too often, that, after impaction has taken place, far more damage will result from leaving the head to be forced out by the action of the uterus, than would occur from any form of instrumental delivery. Table LVIII. clearly demonstrates this, if we accept, as an indication of the extent of injury, the average duration of treatment there shown to have been necessary before the injury was repaired. This is made even more clear in Table LIX., which does not include those aided by ergot, those left to nature, or those for whom the mode of delivery was not given. We have thus one hundred and ten women in whom labor was terminated by artificial means; and there is also shown the number of weeks they were under treatment. The average duration of treatment for one hundred women cured was 15.24 weeks, and for the total number regardless of the result it was 15.48 weeks. By reference again to Table LVIII. it will be seen that the average time under treatment for those who were cured after having been delivered by the efforts of nature was 19.63 weeks, and 21.37 weeks for all of this class who were under treatment. Thus, those who were cured were one month longer under treatment than those who were not cured, and required an additional operation. Those who were delivered by the efforts of nature averaged about six weeks longer under treatment than those who were delivered through artificial means.

Although the number who were delivered through the use of ergot alone is very small, as shown in Table LVIII., and the averages obtained from such would, under ordinary circumstances, be of little value, yet they are, in this connection, not without importance. If there is greater danger in allowing the delivery, after impaction, to be accomplished by dint of uterine contractions, it is shown to be still more so where these have been increased by the use of ergot. There were six such cases, and they averaged over thirty-four weeks under treatment, in contrast to fifteen weeks, in round numbers, for the cases cured who had been delivered through artificial means. In other words, these cases were nearly five months longer under treatment than those delivered by instruments, and over three months longer than those who were left to the efforts of nature.

Table LIX.—*Showing average Duration of Treatment, and the Result for all who were Delivered by Instruments.*

	Cured.		Improved.		Not improved.		Died.		Result not given		Total.	
	Number of women.	Weeks under treatment.	Number of women.	Weeks under treatment.	Number of women.	Weeks under treatment.	Number of women.	Weeks under treatment.	Number of women.	Weeks under treatment.	Number of women.	Weeks under treatment
Forceps	67	1127	5	129	1	8	..	....	1	4	74	[illegible]
Ergot and forceps	7	87	..	....	..	....	..	....	..	....	7	[illegible]
Craniotomy	11	150	2	32	..	....	1	6	..	....	14	[illegible]
Version and craniotomy	2	18	..	....	..	....	..	....	..	....	2	[illegible]
Version	3	22	..	....	..	....	..	....	..	....	3	22
Version and forceps	1	33	..	....	..	....	..	....	..	....	1	[illegible]
Traction	9	75	..	....	..	....	..	....	..	....	9	[illegible]
Total number of women	100	....	7	....	1	....	1	....	1	....	110	
Total number of weeks under treatment	..	1524	..	161	..	8	..	6	..	4	..	1733
Average time under treatment, in weeks	15.24		22.85		8.00		6.00		4.00		13.4[illegible]	

These facts should serve to remove much of the prejudice which still exists against instrumental delivery. While it may be true that instruments are often resorted to without any urgent necessity, still we must not ignore the consequence of allowing labor to be too protracted. Vesico-vaginal fistula cannot occur as the consequence of a slough, if delivery is always brought about as soon as the head fails to recede after each pain.

About fifty per cent. of all the children are stillborn in labors which result in vesico-vaginal fistula. This is shown in Table LX., and also that the proportion of deaths is about the same whether the children were delivered by forceps or through the efforts of nature. The average duration of labor for these cases was 62.39 hours. The average time in labor for those delivered without aid was 46.73 hours, and 66.07 hours for those in whom labor was terminated by artificial means. The average is given on both the time in labor and that under treatment for each mode of delivery, so that a comparison can be readily made.

It was noted that thirty of these stillborn children were of a remarkable size, and that two weighed sixteen pounds each. The average on the total number, where the weight was stated, is a fraction over fourteen pounds, which is beyond question erroneous and exaggerated. The greater portion of these children were males, which are generally larger than females.

TABLE LX.—*Mode of Delivery, and Time under Treatment, for cases in which the Children were Stillborn.*

	No. of cases.	Total hours in labor.	Average No. of hours in labor.	Unusually large children.	No. of cases bladder emptied.	No. of cases bladder not emptied.	Average No. of hours urine retained.	No. of cases condition of bladder not stated.	No. of cases with escape of urine from delivery.	No. of cases with escape of urine later.	Av. time after labor at which urine began to escape (days).	Average time under treatment in weeks.
Forceps	34	2606	76.61	12	8	6	67.50	20	13	16	8.57	15.58
Ergot	5	320	64.00	4	..	4	86.25	1	3	1	2.00	41.00
Ergot and forceps	6	259	43.20	2	2	..	....	4	3	2	11.50	13.50
Craniotomy	13	693	53.33	4	2	4	57.25	7	6	6	10.16	15.00
Version and craniotomy	1	28	28.00	..	..	..	....	1	..	..	....	9.00
Version	2	26	13.00	..	1	..	....	1	2	..	....	7.50
Version and forceps	2	46	36.00	..	..	..	....	2				
Traction: delivery of body after birth of head	8	624	78.00	1	1	3	71.33	4	3	5	11.00	8.75
By the unaided efforts of nature	15	701	46.73	7	3	4	50.25	8	..	13	10.84	12.21
Total No.	86	..	62.39	30	17	21	66.33	48	30	43	9.87	15.45

A comparison can be made between Tables LX. and LV., in both of which the condition of the bladder during labor is noted. It is evident, although the record is so defective, that the bladder was not emptied in a large proportion of the women who bore these stillborn children. As the bladder was over-distended for over 66.33 hours on an average, we may readily conceive that the life of the child would thereby have been frequently lost in consequence of the greater force needed to terminate the labor. Table LVI. shows that the urine escaped at birth in 29.24 per cent., and after the lapse of a certain time in 40.93 per cent. of all women who suffered from vesico-vaginal fistula. Among the women who gave birth to dead children there were 34.88 per cent. where this loss of urine took place from the moment of delivery. On the other hand, with 50 per cent. the loss of control did not occur until after an average interval of 9.87 days from the time of labor, when a slough separated.

TABLE LXI.—*Showing the Labor in which the Injury was received, and the Number of Weeks under Treatment.*

	The number of weeks under treatment.																														Number for each labor.
In which labor injured.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	16.	17.	18.	20.	22.	23.	26.	28.	32.	36.	52.	60.	78.	84.	104.	156.	260.	Time not given.	
First . . .	6	13	5	5	4	9	1	...	...	7	...	...	2	1	2	2	1	1	6	...	3	2	1	1	4	1	...	1	1	6	85
Second . . .	...	6	2	2	1	...	2	2	...	3	...	1	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	2	24
Third . . .	2	3	...	1	...	1	...	...	...	1	...	...	1	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	11
Fourth . . .	...	2	1	...	1	2	...	1	...	1	3	...	1	...	...	1	...	...	1	...	...	...	2	...	...	...	...	...	...	...	16
Fifth . . .	...	1	...	1	1	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7
Sixth . . .	...	3	...	...	...	...	1	2	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8
Seventh . .	...	2	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4
Eighth . . .	...	...	...	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	4
Ninth . . .	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Tenth . . .	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
Eleventh . .	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	3
Fifteenth . .	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
No record . .	...	...	1	...	1	...	...	..	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	4
Number for each period of treatment	8	30	10	10	9	15	6	7	2	12	3	1	9	1	2	6	2	1	8	1	3	3	4	1	4	1	1	1	1	9	171

The women giving birth to stillborn children were cured, on an average, in 15.45 weeks, which is less than that taken on the total number of women with fistula. Excepting for those delivered through the aid of ergot, these averages are all lower than the corresponding ones of the women who had given birth to living children. We have already made this comparison, showing that the women with whom the labors had been terminated through the efforts of nature were a shorter time in labor, but much longer under treatment than those delivered through artificial means.

If this is not due merely to the small number of this class, the fact is almost inexplicable.

It is shown by Table LX. that the average time necessary for a woman to be under treatment, when she had borne a dead child through the efforts of nature, was nine weeks less than would be needed if she had given birth to a living child without assistance.

It can be readily understood that the risk of damage to the mother is much less in the artificial delivery of a dead child than that of a living one, from the possibility of its being compressed into a smaller mass.

But it is important to determine the stage of labor in which the death of the child occurred, for it is scarcely to be supposed that the unaided uterine efforts could expel a dead child with less damage to the soft parts of the mother than would be inflicted by a living one.

Table LXI. is presented as a part of the history of the lesion, for the purpose of showing, in connection with the labor, the number of weeks these women with vesico-vaginal fistula were under treatment. Thus 6 women, injured in their first labor, and 2 in their third, were three weeks under treatment. At the other extreme, one case was 260 weeks, or over five years, under treatment before the injury could be repaired.

Of the total 171 cases, the largest number for any one period was 30 women, who were each four weeks under treatment.

We now naturally pass to consider the connection between the time in labor, the required number of operations, the period under treatment, and the result. Thus by Table LXII. it will be seen that there were one hundred women who had but one operation.

Ninety of these were able to state with accuracy the time in labor (their average being 57.05 hours), while ten were unable to do so.

The average duration of treatment for one hundred was 8.38 weeks. Of these ninety-two who were cured averaged 8.30 weeks; four were improved after a certain time; two were not benefited; one died; and

TABLE LXII.—*Showing Number of Cases operated on; Number of Operations; average Duration of the Labors in which the injury was received; average Duration of Treatment, and Result.*

Number of operations	1.	2.	3.	4.	5.	7.	8.	10.	14.	20.	Unknown.	Whole number
Cases in which the duration of labor was given	90	36	12	6	3	1	1	1	2	1	3	156
Average time in labor (hours)	57.05	63.27	61.25	37.66	110.66	50.00	96.00	48.00	70.00	24.00	26.66	68.61
Cases in which the duration of labor was unknown	10	3	2	......	......	......	......	......	......	......	......	15
Number operated on	100	39	14	6	3	1	1	1	2	1	3	171
Percentage on all	58.53	22.80	8.18	3.50	1.75	.58	.58	.58	1.16	.58	1.75	
Average time under treatment (weeks)	8.38	16.02	28.23	85.20	34.66	60.00	80.00	....	91.00	156.00	....	17.32
Cured	92	33	13	5	2	1	1	......	1	1	......	149
Percentage	....	....	....	....	....	....	....	....	....	....	....	87.13
Average time under treatment (weeks)	8.30	15.66	25.25	85.20	20.00	60.00	80.00	....	104.00	156.00	....	16.82
Improved	4	4	1	......	1	......	......	1	......	......	......	11
Percentage	....	....	....	....	....	....	....	....	....	....	....	6.43
Average time under treatment (weeks)	14.25	22.66	52.00	....	52.00	....	....	....	....	....	....	25.44
Not improved	2	1	......	1	......	......	......	......	......	......	......	4
Percentage	....	....	....	....	....	....	....	....	....	....	....	2.33
Average time under treatment (weeks)	4.00	8.00	....	....	....	....	....	....	....	....	....	5.33
Died	1	......	......	......	......	......	......	......	......	......	......	1
Percentage	....	....	....	....	....	....	....	....	....	....	....	.58
Average time under treatment (weeks)	6.00	....	....	....	....	....	....	....	....	....	....	6.00
Result unknown	1	1	......	......	......	......	......	......	1	......	3	6
Average time under treatment (weeks)	4.00	....	....	....	....	....	....	....	78.00	....	....	41.00

in one instance no record was made of the result of treatment. 58.53 per cent. had but one operation.

It is shown that one hundred and forty-nine cases, or 87.13 per cent., were cured, so many improved, not improved, etc. Finally for the total number of one hundred and seventy-one cases of vesico-vaginal fistula, the average time under treatment for each was 17.32 weeks.

I have no reason to be dissatisfied with this result. A large number had been operated on before admission without success, and owing to the universal knowledge of this operation, none but the worst cases have for many years been sent to the Woman's Hospital. I claim, however, that we may confidently look for still better results by some 10 per cent., as the operation in all its details is being perfected daily. Only 2.33 per cent. of all the cases I have seen have proved incurable.

Two of these were rendered so from want of tissue, the uterus and whole vagina, and the entire tissues, except the periosteum behind the pubes and ramus, having sloughed away.

A third case, a negro woman, was sent to the Woman's Hospital by Dr. Wm. Geo. Thomas, of Wilmington, N. C., who had detected the difficulty before sending the case to me. A large exostosis existed behind the pubes, and somewhat under the arch, so that it had caused the urethra to be pushed to one side. This growth was the cause of the delay in labor, by which the whole urethra, and the tissues under the arch of the pubes, were lost. A transverse fistula existed at the neck of the bladder, which could have been closed, but under the circumstances it was impossible to give her retentive power. The fourth case was a bad one, but could have been closed but from the fact that she was so excessively fat it was impossible even to bring the parts into view.

The eleven cases noted as simply improved, were every one cured, or could have been, after leaving the hospital, by an additional operation. The openings were caused by the accidental cutting out of some stitch, and in several instances, I am satisfied the opening closed by contraction. Finally, the single death resulted from advanced disease of the kidney, and the operation for closing the fistula was but the accident.

ABSTRACT OF CASES OF VESICO-VAGINAL FISTULA

Treated in the Woman's Hospital.

I.—RESULTING FROM CHILDBIRTH.

The Roman numerals indicate the numbers borne by the cases in the author's monograph on Vesico-Vaginal Fistula.

1 (LXIV.). *Admitted* Sept. 20, 1862. Age 20. Age at marriage 18. No. of children 1; of miscarriages 2.

History. In labor 24 hours: head born in 10 hours; body 14 hours afterwards; stillborn; 11¼ pounds; ergot; bladder not emptied for 84 hours.—*Extent of Lesion.* Base of bladder, cervix, and urethra destroyed; vagina shortened and contracted by a circular slough at the outlet.—*Treatment.* By 20 operations for opening the vagina, closing the fistula, and forming a new urethra.—*Duration of Treatment,* 3 years; *Result,* cured.—*Remarks.* Had cystitis 18 months afterwards; bladder opened, calculi removed; opening not closed again.

2 (XXVIII.). *Admitted* Oct. 10, 1862. Age 25. Age at marriage 24. No. of children 1.

History. In labor 101 hours: natural delivery; failed in applying forceps; bladder not emptied; urine escaped from delivery.—*Extent of Lesion.* Loss of one-third of the base of the bladder in front of the cervix; fistula concealed; vagina shortened by anterior lip being drawn backward from contraction of cicatricial tissue in the posterior cul-de-sac.—*Treatment.* Cicatricial bands divided on each side, the vagina was lengthened an inch, and fistula brought into view; closed by 8 sutures; one operation.—*Duration of Treatment,* 4 weeks; *Result,* cured.

3 (LV.). *Admitted* Oct. 26, 1862. Age 30. No. of children 4.

History. In labor 74 hours: delivered by forceps; stillborn; no statement as to emptying the bladder; 17 days after delivery a slough was passed, and loss of urine followed.—*Extent of Lesion.* A triangular-shaped fistula, situated behind left ramus, extended across the vagina to the opposite side of the cervix; the edges were nearly in contact, but originally there had been great loss of tissue.—*Treatment.* To bring the opening into view and to close it, it was necessary to dissect its base free from the bone; one operation; 5 sutures; removed 9th day.—*Duration of Treatment,* 5 weeks; *Result,* cured.

4. *Admitted* Oct. 29, 1862. Age 33. Age at marriage 29. No. of children 1.

History. In labor 50 hours: bladder not emptied.—*Extent of Lesion.* Fistula extended from the middle of the urethra to the neck of the bladder.—*Complications.* Vagina contracted from a circular slough.—*Treatment.* 7 operations for opening the vagina, closing the fistula, and forming new urethra.—*Duration of Treatment,* 15 months; *Result,* cured.

5 (XXVII.). *Admitted* Nov. 24, 1862. Age 29. No. of children 7.

History. In labor 67 hours: natural delivery; stillborn; large child; bladder not emptied for 24 hours; urine escaped on the 8th day. Injured two years before admission.—*Extent of Lesion.* Loss of the whole base of the bladder; crescentic shaped fistula, with the corners drawn into the posterior cul-de-sac; cervix formed the posterior boundary.—*Complications.* Cervix lacerated from before backward.—*Treatment.* Fistula closed with 19 sutures; one operation; difficult on account of cicatricial edges; sutures removed 9th day.—*Duration of Treatment,* 4 weeks; *Result,* cured.

6 (XXXIV.). *Admitted* Dec. 11, 1862. Age 31. Age at marriage 19. No. of children 2; of miscarriages 2.

History. In labor 20 hours: forceps; child 12 pounds; bladder not emptied; injured one year before admission; urine escaped 3 weeks after delivery.—*Extent of Lesion.* Fistula oblique from the right of the cervix to the left of the neck of the bladder.—*Complications.* Pregnant 3 months when admitted.—*Treatment.* Extensive dissection of tissue necessary to free the edges; 8 sutures used; one operation; sutures removed 11th day.—*Duration of Treatment,* 5 weeks; *Result,* cured.

7. *Admitted* Feb. 3, 1863. Age 28. Age at marriage 24. No. of children 2.

History. In labor 36 hours: stillborn; progress arrested several hours; delivered by efforts of nature on changing position of head; bladder not emptied; slough passed 12th day; loss of urine afterwards; last labor three years before admission. —*Extent of Lesion.* Anterior lip of the uterus sloughed, with fistula in front of it; on account of the position of the uterus and shortening of the vagina, after sloughing, the anterior wall formed a fold in front of the opening so that it could not be brought into view even on the knees and elbows.—*Complications.* Uterus retroverted and fixed by old cellulitis.—*Treatment.* Split the anterior wall of the vagina through the median line of the fold into the fistula, and closed all as one opening; closed all but a small opening near the uterus; several operations performed with great difficulty.—*Result*, improved.—*Remarks.* Never returned for final operation.

8 (xviii.). *Admitted* Feb. 7, 1863. Age 30. Age at marriage 19. No. of children 6.

History. Instrumental delivery after 67 hours in labor: pocket-knife and a blunt hook used; bladder emptied naturally; loss of urine from delivery. Injured five months previous to admission.—*Extent of Lesion.* Anterior lip lost and a large portion of the base of the bladder; by cicatricial tissue the vaginal wall was drawn into a fold so as to hide the fistula from view; the cervix projected into the bladder through the fistula.—*Complications.* Uterus retroverted and immovable from old cellulitis.—*Treatment.* As the uterus could not be moved, the crest of the fold was united to the posterior lip with 9 sutures; operation successful; afterwards, a small opening caused by traction; closed by another operation.—*Duration of Treatment*, 10 weeks; *Result*, cured.

9 (xii.). *Admitted* March 7, 1863. Age 40. Age at marriage 32. No. of children 2.

History. Injured in the second delivery; 71 hours in labor: completed by the efforts of nature; ergot; stillborn; bladder emptied; slough passed two weeks after delivery; loss of urine afterwards. Injured five years before admission.—*Extent of Lesion.* Laceration of the anterior lip in the median line, with sloughing of nearly two inches along the base of the bladder; the vaginal wall was drawn into a deep fold on each side of the fistula.—*Treatment.* The sides of the fold and of the tear through the cervix were united in common with the edges of the fistula; eleven sutures; line two inches and a half in length; sutures removed 10th day; one operation.—*Duration of Treatment*, 6 weeks; *Result*, cured.

10 (vi.). *Admitted* March 8, 1863. Age 32. Age at marriage 21. No. of children 6.

History. In labor 18 hours: delivered by version; stillborn; bladder emptied by catheter; urine escaped on the day after delivery; injured in the last labor; delivered by forceps in her previous labors.—*Extent of Lesion.* Laceration of the anterior lip of the cervix uteri and base of the bladder in the median line; partially closed by nature, leaving a sinus from the bladder communicating with the cervical canal above the vaginal junction.—*Complications.* Deep double laceration of cervix laterally from a previous labor.—*Treatment.* Cured by uniting the sides of the laceration and thus closing the os uteri.—*Duration of Treatment*, 9 weeks; *Result*, cured.—*Remarks.* Could now be cured by laying open the sinus, removing its walls, and then bringing the sides together with sutures, leaving the os open.

11. *Admitted* April 2, 1863. Age 28. Age at marriage 21. No. of children 5.

History. Injured in the fifth labor; 96 hours' duration: delivered with forceps; bladder not emptied for 60 hours.—*Extent of Lesion.* An opening an inch in diameter extending across the vagina and situated just in front of the cervix.—*Complications.* Cervix destroyed.—*Treatment.* Os turned into the bladder by uniting the anterior edge of the fistula to the posterior wall of the vagina; 14 sutures removed the 9th day.—*Duration of Treatment*, 8 weeks; *Result*, cured.—*Remarks.* Had been operated on three times previous to admission.

12 (xxxii.). *Admitted* April 13, 1863. Age 20. No. of children 1.

History. First pregnancy; in labor 90 hours: delivery by forceps; stillborn;

catheter passed regularly; escape of urine immediately after delivery.—*Extent of Lesion*. A transverse fistula in front of the cervix, an inch or more in length, had been closed by a previous operation, leaving a small opening admitting a probe. —*Complications*. An attempt had been made to close the fistula with the cautery, causing cicatricial tissue.—*Treatment*. Two operations; first was unsuccessful on account of the cicatricial edges; an opening one inch long made by removing this tissue at the second operation; 7 sutures, removed 9th day.—*Duration of Treatment*, 8 weeks; *Result*, cured.

13 (XLVIII.). *Admitted* April 27, 1863. Age 33. Age at marriage 27. No. of children 1.

History. In labor 5 days: delivered by forceps three years before admission. bladder emptied twice.—*Extent of Lesion*. A transverse fistula at the neck of the bladder, two inches in length; vagina only an inch deep, occluded above the fistula, retaining menstrual blood.—*Treatment*. Fistula closed by one operation with 8 sutures; vagina opened five times with the knife; succeeded by laceration. —*Duration of Treatment*, 21 months; *Result*, cured.—*Remarks*. History of case detailed in full in Chapter on Retained Menstruation, etc.

14. *Admitted* May 30, 1863. Age 32. Age at marriage 30. No. of children 1; of miscarriages 1.

History. In labor 36 hours: forceps; child very large; bladder not emptied.—*Extent of Lesion*. Fistula in the median line, one inch in length.—*Treatment*. One operation; 6 sutures, removed 8th day.—*Result*, cured.

15 (LI.). *Admitted* June 8, 1863. Age 32. Age at marriage 18. No. of children 2.

History. Second pregnancy; twins; 28 hours in labor: first delivered by breech; second by craniotomy.—*Extent of Lesion*. Fistula half an inch in diameter in the line of a former opening resulting from the first labor.—*Complications*. Antero-posterior diameter of pelvis 2⅜ inches; partial occlusion of the vagina.—*Treatment*. Vagina dilated by sponge-tents to close the fistula; 8 sutures; allowed to contract afterward, to prevent impregnation.—*Duration of Treatment*, 9 weeks; *Result*, cured.—*Remarks*. First fistula was closed by Dr. Emmet, July, 1862.

16 (LVI.). *Admitted* Oct. 1, 1863. Age 30. Age at marriage 24. No. of children 4.

History. In labor 44 hours: natural delivery after ergot; child very large; stillborn; bladder was emptied regularly; loss of urine after 24th day.—*Extent of Lesion*. Triangular-shaped opening behind the left ramus.—*Treatment*. Closed with great difficulty by 6 sutures; removed 8th day.—*Duration of Treatment*, 4 weeks; *Result*, cured.

17 (LXVI.). *Admitted* Oct. 1, 1863. Age 38. Age at marriage 14. No. of children 8.

History. In labor 84 hours: delivered by forceps, after ergot; no recollection of emptying the bladder; urine lost after the 7th day.—*Extent of Lesion*. Loss of one-third of the lower portion of the vagina just beyond the neck of the bladder, but by contraction of the vagina the edges lay almost in contact, and extended from one ramus to the other.—*Complications*. Rectal fistula.—*Treatment*. Closed the opening with 11 sutures; removed on the 8th day; required several months of preparatory treatment before operation.—*Result*, cured.

18. *Admitted* Oct. 5, 1863. Age 41. Age at marriage 28. No. of children 4; of miscarriages 3.

History. In the last labor 1 hour: foot presentation; delivered by version.—*Extent of Lesion*. Fistula small; laceration through the anterior lip of the cervix. —*Treatment*. By two operations.—*Duration of Treatment*, 7 weeks; *Result*, cured.

19 (XLIV.). *Admitted* Oct. 7, 1863. Age 35. Age at marriage 14. No. of children 5; of miscarriages 1.

History. Injured in the 4th labor, of 7 hours: natural delivery; placenta retained 12 hours; urine escaped from time of delivery; 7 years previous to admission; last child 5 years after.—*Extent of Lesion*. Loss of the entire base of the bladder, with bands extending from each side of the cervix to the pubes; vagina shortened, the cervix being near the neck of the bladder, and fistula contracted to an inch in diameter.—*Complications.* Neck of the uterus drawn into the bladder by contraction of cicatricial bands.—*Treatment.* First operation successful, with 7 sutures; afterwards an opening as large as a probe occurred behind the right ramus; second operation unsuccessful; third one successful by dissecting the tissues free from the face of the ramus.—*Duration of Treatment,* 13 weeks; *Result,* cured.

20 (LIII.). *Admitted* Oct. 18, 1863. Age 32. Age at marriage 20. No. of children 6.

History. In labor 115 hours: forceps; child stillborn and very large; urine escaped from the time of delivery. Injured six months previous to admission.—*Extent of Lesion.* Fistula in front of the uterus large enough to admit the index finger.—*Complications.* Vagina narrowed to admit only a probe to the depth of an inch and a half; cul-de-sac destroyed; uterus retroverted and bound down by adhesions.—*Treatment.* Vagina opened by two operations; fistula closed by one operation and 6 sutures transverse to the axis of the vagina; removed 9th day.—*Duration of Treatment,* 10 weeks; *Result,* cured.

21 (LII.). *Admitted* Oct. 20, 1863. Age 22. Age at marriage 20. No. of children 1.

History. In labor 51 hours: ergot and forceps; stillborn; some urine lost two days after delivery; no control after three weeks, when a slough was passed. Delivered three months before admission.—*Extent of Lesion.* Fistula just in front of the cervix; there had been great loss of tissue, but now contracted to the size of No. 12 bougie; cicatricial edges.—*Complications.* Vagina shortened and partially occluded by bands in front of and concealing the fistula.—*Treatment.* With the edges of the fistula, one-third of an inch of surrounding tissue was removed; 6 sutures used; there was so little bleeding after dividing the bands that a plug was not needed and the operation was done at the same time.—*Duration of Treatment,* 7 weeks; *Result,* cured.

22 (LIX.). *Admitted* Nov. 27, 1863. Age 35. Age at marriage 28. No. of children 4.

History. In labor 102 hours: delivered by forceps; stillborn child, under the average size; bladder not emptied; escape of urine from delivery. Injured fourteen months before admission.—*Extent of Lesion.* Very large circular slough; narrowing of vagina; loss of part of urethra; cicatricial bands, extending from under the pubis downward and backward to the recto-vaginal septum, formed two folds beneath which was a small opening into neck of bladder.—*Treatment.* Fistula closed without dividing the bands, for had this been done, incontinence of urine would have resulted, as the neck of the bladder was lost; 6 sutures used; removed on the 14th day; cured by one operation.—*Duration of Treatment,* 8 weeks; *Result,* cured.

23 (XLII.). *Admitted* Dec. 18, 1863. Age 25. Age at marriage 23. No. of children 1.

History. In labor 105 hours: forceps; child very large and stillborn; bladder not emptied; urine escaped 4 days after delivery. Injured five months before admission.—*Extent of Lesion.* Loss of the left half of the base of the bladder; semicircular opening two inches long and one wide.—*Treatment.* Fistula closed by one operation; 10 sutures; the difficulty was in passing the sutures to radiate from a common centre, so that two different arcs of a circle could be brought together without puckering.—*Duration of Treatment,* 6 weeks; *Result,* cured.

24 (XXXVII.). *Admitted* Jan. 28, 1864. Age 40. Age at marriage 28. No. of children 4.

History. In labor 105 hours: forceps; child large and stillborn; bladder frequently emptied; urine escaped from time of delivery. Injured seven years previous to admission.—*Extent of Lesion.* Loss of the whole base of the bladder; the inner face of the left ramus was denuded.—*Treatment.* Fistula closed by three progressive operations; it was necessary to dissect up the tissues freely to free the edges.—*Duration of Treatment,* 3 months; *Result,* cured.

25. *Admitted* Feb. 2, 1864. Age 26. Age at marriage 24. No. of children 1.
History. In labor 5 days: delivered by forceps; bladder emptied naturally; admitted ten days after delivery.—*Extent of Lesion.* An opening in the centre of the base of the bladder admitting the index finger.—*Complications.* Rectal fistula.—*Treatment.* Fistula closed in three weeks by the frequent use of hot water, vaginal injections, and without an operation.—*Duration of Treatment,* 3 weeks; *Result,* cured.

26 (lxviii.). *Admitted* Feb. 2, 1864. Age 27. Age at marriage 19. No. of children 1.
History. In labor 65 hours: delivered by efforts of nature; bladder not emptied until 24 hours after delivery; urine then lost for several weeks, when she regained retentive power for a time. Injured two years.—*Extent of Lesion.* The opening into the bladder was not suspected until after dividing some cicatricial bands, when the tension being relieved the urine continued to escape from a fistula behind the left ramus, admitting a No. 12 bougie.—*Complications.* Rectal fistula. *Treatment.* Fistula closed without difficulty with 8 sutures and by one operation.—*Duration of Treatment,* 6 weeks; *Result,* cured.

27 (vii.). *Admitted* April 4, 1864. Age 26. Age at marriage 21. No. of children 3.
History. In labor 37 hours: natural delivery; stillborn; weighed 12 pounds; the bladder was not emptied; injured 21 months; urine lost after the 14th day.—*Extent of Lesion.* A sinus from the bladder entered the cervical canal above the vaginal junction, from a laceration of the cervix through the anterior lip, in the median line, which had united from above, leaving the sinus at the bottom of the tear.—*Treatment.* Reproduced, with a pair of scissors, the original condition, then obliterated the tract of the sinus; surfaces were brought together by 5 sutures at one operation.—*Duration of Treatment,* 4 weeks; *Result,* cured.—*Remarks.* Had been operated on twice before admission, and with benefit.

28 (xvi.). *Admitted* April 10, 1864. Age 27. Age at marriage 24. No. of children 1.
History. In labor 104 hours: natural delivery; very large child, stillborn; the bladder was not emptied until after delivery; began to lose control after two weeks. Injured two years.—*Extent of Lesion.* Loss of two-thirds of the base of the bladder in front of the cervix, with the posterior lip and cul-de-sac; fistula from one ramus to another, with receding edges. A false passage had been made from the urethra about a third of an inch in front of the fistula.—*Complications.* Angle of the fistula on the right side; the surrounding parts were a mass of cicatricial tissue; urethra impervious, with a false opening into the vagina.—*Treatment.* First operation was to open the urethra; a week after, closed the fistula with 14 sutures; successful; a small opening afterwards from tension, which was closed by a subsequent operation.—*Duration of Treatment,* 9 weeks; *Result,* cured.

29 (xxii.). *Admitted* April 27, 1864. Age 33. Age at marriage 27. No. of children 2; of miscarriages 1.
History. In labor 70 hours: delivered by forceps; child stillborn; 10 pounds; the bladder was not emptied until by catheter before applying the forceps; urine escaped a week after delivery. Injured thirty-four months.—*Extent of Lesion.* Anterior lip lost, with a large portion of the bladder, forming a transverse fistula from one side of the vagina to the other; nature attempted to close the fistula by uniting a portion of its anterior edge to the posterior lip of the uterus and vaginal wall on a line with the cervix; in this line two openings were left, one small, the other admitting the finger.—*Treatment.* Nature had shut the mouth of the uterus up within the bladder, and this effort was completed; 9 sutures were used for the larger opening, and 3 for the smaller one; they were removed on the 8th day.—*Duration of Treatment,* 5 weeks; *Result,* cured.

30 (xiii.). *Admitted* May 24, 1864. Age 24. Age at marriage 22. No. of children 1.
History. In labor 50 hours: delivered by forceps; large child, stillborn: [illegible] emptied regularly; a slough passed on the 19th day; loss of urine after-

wards. Injured two months.—*Extent of Lesion.* A slough had extended from the cervix to the neck of the bladder; by healing from both ends, the fistula contracted to a circular opening, only large enough to admit the index finger, and was situated in the centre of the base of the bladder.—*Complications.* Laceration of the anterior lip.—*Treatment.* Two parallel incisions were made on each side of the fistula, through the cicatricial tissue, and these surfaces were united by 7 sutures; removed on the 9th day.—*Duration of Treatment*, 8 weeks; *Result*, cured.

31 (x.). *Admitted* June 3, 1864. Age 40. Age at marriage 26. No. of children 9.

History. Labor 42 hours: ergot, forceps; large stillborn child; bladder not emptied; urine lost from delivery. Injured three months.—*Extent of Lesion.* Lateral laceration into the bladder through the cervix on the right side; opening large enough to admit two fingers.—*Treatment.* First operation not entirely successful; 9 sutures were used; readmitted, and by second operation closed, using 9 sutures.—*Duration of Treatment*, 8 weeks; *Result*, cured.

32 (xxx.). *Admitted* Sept. 16, 1864. Age 36. No. of children 1.

History. Puerperal convulsions on the 3d day; in labor 96 hours: forceps; stillborn; unable to give any information regarding the bladder; escape of urine two weeks after delivery. Injured eleven months.—*Extent of Lesion.* Loss of the upper third of the base of the bladder; by cicatrization and shortening of the vagina, the opening reduced in size so as to admit the point of a large sound.—*Complications.* Great extent of cicatricial tissue.—*Treatment.* A concave incision was made in healthy tissue half an inch from the neck of the bladder and around the fistula; the cicatricial edges were removed; closed by 9 sutures.—*Duration of Treatment*, 6 weeks; *Result*, cured.

33 (xli.). *Admitted* Oct. 10, 1864. Age 46. Age at marriage 21. No. of children 10.

History. In last labor 95 hours: ergot; delivered "by hand;" child had been dead some time; bladder not emptied for 83 hours; loss of urine from delivery. Injured four years and a half.—*Extent of Lesion.* Loss of the right half of the base of the bladder; by contraction, the vagina was shortened and the fistula reduced to less than an inch in size and hidden at the bottom of two deep folds.—*Treatment.* Edges of the fistula were cicatricial; these were denuded with the sides of the folds and brought together by 16 sutures.—*Duration of Treatment*, 5 weeks; *Result*, cured.

34 (xxxiii.). *Admitted* Oct. 11, 1864. Age 31. Age at marriage 21. No. of children 4.

History. Chloroform; 21 hours in labor: delivered by forceps; child 16 pounds; stillborn; bladder was emptied; loss of urine from delivery; confined to her bed several months. Injured 41 months.—*Extent of Lesion.* Loss of the whole base of the bladder; the fistula was more than three inches in length, and extended obliquely to the right across the axis of the vagina, from contraction of bands in the posterior cul-de-sac.—*Complications.* The mouth of each ureter was in the edge of the fistula; uterus immovable.—*Treatment.* After division of bands in the cul-de-sac, the fistula was closed by 20 sutures; successful; twice afterwards, by traction, openings were made and finally closed.—*Duration of Treatment*, 18 weeks; *Result*, cured.—*Remarks.* Had been operated on twice previous to admission.

35 (xliii.). *Admitted* Oct. 14, 1864. Age 31. Age at marriage 22. No. of children 2.

History. In labor 90 hours: delivered by efforts of nature after the use of ergot; bladder not emptied; urine escaped from delivery; legs paralyzed for several weeks. Injured three years and a half.—*Extent of Lesion.* The left half of the base of the bladder was lost by sloughing, with the neck of the uterus and posterior cul-de-sac; the vagina was shortened and narrowed, with occlusion of the uterine canal; uterus atrophied.—*Treatment.* Fistula, after much difficulty, was closed by 19 sutures; on removing the sutures, a small opening was made, which closed by subsequent operation; another small opening closed by contraction.—*Duration of Treatment*, 12 weeks; *Result*, cured.

deep sulcus.—*Complications.* A recto-vaginal fistula.—*Treatment.* A cicatricial band crossed the remains of the urethra and ran backward on to the posterior wall; this gave retentive power after the fistula had been closed with 9 sutures; the line of union extended from one ramus to the other.—*Duration of Treatment*, 6 weeks; *Result*, cured.

47 (LX.). *Admitted* April 22, 1865. Age 28. Age at marriage 18. No. of children 1; of miscarriages 1.

History. In labor 71 hours: delivered by traction; bladder had been emptied regularly; urine began to escape from delivery.—*Extent of Lesion.* A fistula three inches in length extended through the neck of the bladder across from ramus to ramus; the vaginal outlet had been encircled by a slough; this drew the corners up behind the bones, while only the urethra had been lacerated.—*Treatment.* The opening was at the bottom of a deep sulcus; the only difficulty was in approximating the two sections of the urethra; 12 sutures were used.—*Duration of Treatment*, 5 weeks; *Result*, cured.

48 (XXIII.) *Admitted* May 25, 1865. Age 44. Age at marriage 22. No. of children 3.

History. Natural labor of 26 hours: the bladder was not emptied; urine began to escape on the 3d day.—*Extent of Lesion.* Loss of the cervix uteri, with the whole base of the bladder; by bands in the cul-de-sac the fistula, which was three inches in length, was drawn into a crescentic form, with its cornua posterior to the cervix uteri.—*Treatment.* Bands were freely divided and tissues dissected up from behind the bone; operation on the knees and elbows, very difficult; 14 sutures used.—*Duration of Treatment*, 4 weeks; *Result*, cured.

49. *Admitted* Sept. 30, 1865. Age 34. Age at marriage 23. No. of children 1; of miscarriages 2.

History. In labor 26 hours: child very large; bladder not emptied.—*Extent of Lesion.* The entire base of the bladder lost; vagina contracted by cicatricial bands.—*Treatment.* Four operations.—*Duration of Treatment*, 5 years; *Result*, cured.

50 (VIII.). *Admitted* Oct. 2, 1865. Age 20. Age at marriage 19. No. of children 1.

History. In labor 45 hours: delivered by craniotomy; bladder not emptied the last 24 hours; loss of urine from the 3d day.—*Extent of Lesion.* Anterior laceration of the cervix, which, becoming partially closed, left a sinus communicating with the uterine canal from a large fistula in front.—*Treatment.* With a pair of scissors the original condition was produced; the tract of the sinus removed and the edges of the opening closed by 8 sutures.—*Duration of Treatment*, 4 weeks; *Result*, cured.

51. *Admitted* Oct. 3, 1865. Age 31. Age at marriage 20. No. of children 6.

History. In labor 90 hours: delivered by craniotomy; bladder was regularly emptied.—*Extent of Lesion.* The base of the bladder was lost, vagina contracted, and by this means the cervix was turned into the bladder.—*Treatment.* 2 operations.—*Duration of Treatment*, 5 months; *Result*, improved.—*Remarks.* Did not return for a final operation, and may have been cured.

52. *Admitted* Oct. 3, 1865. Age 30. Age at marriage 28. No. of children 2.

History. In labor 19 hours: delivered with forceps; stillborn; bladder emptied.—*Extent of Lesion.* Fistula one inch in diameter just in front of the neck of the bladder; there had been great loss of tissue with contraction.—*Treatment.* 2 operations; one only for closing the fistula.—*Duration of Treatment*, 9 weeks; *Result*, cured.

53 (XXVI.). *Admitted* Oct. 4, 1865. Age 30. Age at marriage 27. No. of children 2.

History. Delivered by craniotomy: in labor 49 hours; the bladder was not emptied; urine escaped from delivery; confined to bed three months. Injured eighteen months.—*Extent of Lesion.* A slough had extended in the median line, from the cervix to the neck of the bladder, but by contraction of cicatricial bands laceration through the cervix; 10 sutures were used.—*Duration of Treatment*, 10 weeks; *Result*, cured.—*Remarks*. Stone removed from the bladder eighteen months after operation.

42 (LXV.). *Admitted* Nov. 30, 1864. Age 30. Age at marriage 22. No. of children 2.

History. In labor 92 hours: delivered with forceps; bladder not emptied for 24 hours before delivery; placenta retained three days; on its removal, lost control of the urine; confined to bed for two months. Injured fifty months before admission.—*Extent of Lesion*. Loss of the whole base of the bladder, the cervix uteri, and laceration in the median line almost to the vesico-uterine junction, with destruction of the neck of the bladder and nearly the whole urethra; the uterus was immovable and drawn to the right side.—*Treatment*. After eleven operations the fistula was bridged over; a new urethra was made throughout, and after three additional operations she was discharged, with voluntary retentive power.—*Duration of Treatment*, 2 years; *Result*, cured.

43 (XLVI.). *Admitted* Dec. 2, 1864. Age 19. Age at marriage 18. No. of children 1.

History. In labor 61 hours: ergot; bladder not emptied; large child; stillborn; urine escaped from time of delivery. Injured fifteen weeks.—*Extent of Lesion*. Two fistulæ, one near the neck of the bladder to the right, and the other near the cervix on the same side; there had been lateral laceration of the cervix, with sloughing.—*Complications*. Vagina shortened by bands from the lower fistula across to the left side of the vagina around into the cul-de-sac to the upper opening.—*Treatment*. The band had to be extensively divided, and each fistula was closed by a single operation.—*Duration of Treatment*, 4 months; *Result*, cured.

44 (LXIII.). *Admitted* Dec. 8, 1864. Age 23. No. of children 1.

History. In labor 98 hours: ergot; breech presentation; "instrumental" delivery; child stillborn; 12 pounds; bladder not emptied until just before delivery; urine began to escape on the second day afterwards. Injured about four years.—*Extent of Lesion*. There had been a slough under the arch of the pubes entirely across the vagina, which destroyed the neck of the bladder; after cicatrization an opening was left at the neck of the bladder only large enough to admit a No. 12 bougie; a semilunar shaped band extended from each side of the fistula down on to the posterior wall, so as to contract the vagina.—*Complications*. Occlusion of the urethra.—*Treatment*. The bands were cut and a new urethra made by puncture; a tube was retained in the false passage some ten days, until healed; a month after, the fistula was closed by 5 stures.—*Duration of Treatment*, 2 months; *Result*, cured.

45 (XXXV.). *Admitted* Dec. 21, 1864. Age 32. Age at marriage 25. No. of children 4.

History. Puerperal convulsions: delivered by forceps, after a labor of 51 hours; stillborn; not known if the bladder was emptied; urine did not escape until 3 weeks after delivery: confined to the house for six months after. Injured five years previous to admission.—*Extent of Lesion*. Loss of the entire base and neck of the bladder; at each angle the edges sloped inward, so that opening was but an inch and a quarter long by an inch in width; the tissue in front of the fistula was thrown into numerous folds like a cystocele; vagina shortened, and this mass hid the anterior lip of the fistula.—*Complications*. Extensive cicatricial bands from in front of the fistula to the urethral outlet, backward along the angles to the lateral walls into the cul-de-sac.—*Treatment*. The fistula was closed by bridging over the opening with the cystocele, thus turning the vaginal tissue into the bladder; by this means traction was not made on the shortened urethra.—*Duration of Treatment*, 4 weeks; *Result*, cured.

46 (LXVII.). *Admitted* Feb. 12, 1865. Age 23. Age at marriage 21. No. of children 1.

History. Time of labor and condition of the bladder unknown; delivered by craniotomy a year before first examination.—*Extent of Lesion*. Loss of the greater portion of the neck and base of the bladder, but the vagina had become shortened by contraction, so that the sides of the fistula lay in contact at the bottom of a deep sulcus.—*Complications.* A recto-vaginal fistula.—*Treatment.* A cicatricial band crossed the remains of the urethra and ran backward on to the posterior wall; this gave retentive power after the fistula had been closed with 9 sutures; the line of union extended from one ramus to the other.—*Duration of Treatment*, 6 weeks; *Result*, cured.

47 (lx.). *Admitted* April 22, 1865. Age 28. Age at marriage 18. No. of children 1; of miscarriages 1.

History. In labor 71 hours: delivered by traction; bladder had been emptied regularly; urine began to escape from delivery.—*Extent of Lesion.* A fistula three inches in length extended through the neck of the bladder across from ramus to ramus; the vaginal outlet had been encircled by a slough; this drew the corners up behind the bones, while only the urethra had been lacerated.—*Treatment.* The opening was at the bottom of a deep sulcus; the only difficulty was in approximating the two sections of the urethra; 12 sutures were used.—*Duration of Treatment*, 5 weeks; *Result*, cured.

48 (xxiii.) *Admitted* May 25, 1865. Age 44. Age at marriage 22. No. of children 3.

History. Natural labor of 26 hours: the bladder was not emptied; urine began to escape on the 3d day.—*Extent of Lesion.* Loss of the cervix uteri, with the whole base of the bladder; by bands in the cul-de-sac the fistula, which was three inches in length, was drawn into a crescentic form, with its cornua posterior to the cervix uteri.—*Treatment.* Bands were freely divided and tissues dissected up from behind the bone; operation on the knees and elbows, very difficult; 14 sutures used.—*Duration of Treatment*, 4 weeks; *Result*, cured.

49. *Admitted* Sept. 30, 1865. Age 34. Age at marriage 23. No. of children 1; of miscarriages 2.

History. In labor 26 hours: child very large; bladder not emptied.—*Extent of Lesion.* The entire base of the bladder lost; vagina contracted by cicatricial bands.—*Treatment.* Four operations.—*Duration of Treatment*, 5 years; *Result*, cured.

50 (viii.). *Admitted* Oct. 2, 1865. Age 20. Age at marriage 19. No. of children 1.

History. In labor 45 hours: delivered by craniotomy; bladder not emptied the last 24 hours; loss of urine from the 3d day.—*Extent of Lesion.* Anterior laceration of the cervix, which, becoming partially closed, left a sinus communicating with the uterine canal from a large fistula in front.—*Treatment.* With a pair of scissors the original condition was produced; the tract of the sinus removed and the edges of the opening closed by 8 sutures.—*Duration of Treatment*, 4 weeks; *Result*, cured.

51. *Admitted* Oct. 3, 1865. Age 31. Age at marriage 20. No. of children 6.

History. In labor 90 hours: delivered by craniotomy; bladder was regularly emptied.—*Extent of Lesion.* The base of the bladder was lost, vagina contracted, and by this means the cervix was turned into the bladder.—*Treatment.* 2 operations.—*Duration of Treatment*, 5 months; *Result*, improved.—*Remarks.* Did not return for a final operation, and may have been cured.

52. *Admitted* Oct. 3, 1865. Age 30. Age at marriage 28. No. of children 2.

History. In labor 19 hours: delivered with forceps; stillborn; bladder emptied.—*Extent of Lesion.* Fistula one inch in diameter just in front of the neck of the bladder; there had been great loss of tissue with contraction.—*Treatment.* 3 operations; one only for closing the fistula.—*Duration of Treatment*, 9 weeks; *Result*, cured.

53 (xxvi.). *Admitted* Oct. 4, 1865. Age 30. Age at marriage 27. No. of children 2.

History. Delivered by craniotomy: in labor 49 hours; the bladder was not emptied; urine escaped from delivery; confined to bed three months. Injured eighteen months.—*Extent of Lesion.* A slough had extended in the median line from the cervix to the neck of the bladder, but by contraction of cicatricial bands the opening became a transverse one in front of the cervix.—*Complications.* Vagina shortened by contraction.—*Treatment.* The edges were secured by 14 sutures, as they lay nearly in contact.—*Duration of Treatment*, 4 weeks; *Result*, cured.

54 (III.). *Admitted* Oct. 4, 1865. Age 37. Age at marriage 19. No. of children 5; of miscarriages 1.

History. Labor 45 hours' duration: delivered by forceps; child stillborn and of a large size; bladder was not emptied, although the attempt had been made; loss of urine from delivery. Injured six months.—*Extent of Lesion.* There had been laceration of the cervix through the anterior lip into the base of the bladder, leaving a fistula in the median line one inch in diameter.—*Complications.* Uterus retroverted.—*Treatment.* The opening was irregular in shape and difficult on this account to be brought together; 9 sutures were used; removed on the 11th day. —*Duration of Treatment*, 4 weeks; *Result*, cured.

55 (IV.). *Admitted* Oct. 5, 1865. Age 26. No. of children 1.

History. In labor 72 hours: natural delivery; bladder emptied; child stillborn and of a large size. Injured about seven years.—*Extent of Lesion.* A small circular opening, an eighth of an inch in diameter, in front of the cervix, caused by a laceration through the anterior lip.—*Treatment.* Cut through the cervix to produce the original condition, then united all by 9 sutures.—*Duration of Treatment*, 7 weeks; *Result*, cured.

56. *Admitted* Jan. 23, 1866. Age 24. Age at marriage 22. No. of children 1.

History. In labor 4 days, and delivered by forceps; child stillborn; no information given in relation to the bladder.—*Extent of Lesion.* Fistula in the median line and centre of the base of the bladder, half an inch in diameter.—*Complications.* Recto-vaginal fistula.—*Treatment.* One operation; 8 sutures used and removed on the 8th day.—*Duration of Treatment*, 7 weeks; *Result*, cured.

57 (XL.). *Admitted* Feb. 21, 1866. Age 20. Age at marriage 17. No. of children 1.

History. In labor 24 hours: natural delivery; child 14 pounds; stillborn; on the 3d day the urine began to escape. Injured eleven months.—*Extent of Lesion.* Loss of nearly the whole base of the bladder, a portion of the neck of the uterus, and the cul-de-sac; the fistula crescentic in shape, and the vagina shortened by contraction to an inch and a half, from sloughing.—*Treatment.* After a preparatory operation for enlarging the vagina and dividing the bands, the fistula was closed by two operations, using 16 sutures at one time, and 11 at the other.—*Duration of Treatment*, 17 weeks; *Result*, cured.—*Remarks.* Had been operated on previous to admission.

58 (XXXVIII.). *Admitted* April 3, 1866. Age 27. Age at marriage 25. No. of children 1.

History. In labor 58 hours: delivered by forceps; stillborn; 5 weeks previous to admission; no information in regard to emptying the bladder; urine began to escape on the 2d day.—*Extent of Lesion.* A fistula involving the loss of the whole base of the bladder, with the face of each ramus nearly denuded; the inverted bladder, with a portion of the intestines, frequently became partially strangulated by protruding through the fistula.—*Treatment.* The bands were freely divided and the edge of the fistula dissected off from the inner face of the right ramus; the edges were then closed, from the left ramus to the right of the cervix, by 11 sutures.—*Duration of Treatment*, 8 weeks; *Result*, cured.

59 (XXIX.). *Admitted* Sept. 26, 1866. Age 30. Age at marriage 26. No. of children 3.

History. Delivered by forceps: 30 hours in labor; 7 days after the birth of her child the urine escaped by a sudden gush, while walking about her room. Injured three months.—*Extent of Lesion.* Loss of the upper half of the base of the bladder with a lateral laceration of the cervix by a previous labor; the fistula was crescentic in shape, with its cornua extending into the cul-de-sac, and the anterior lip of the uterus formed its posterior boundary.—*Treatment.* The bands were divided so that the fistula became a transverse one, into which three fingers could be passed; closed by 14 sutures, which were removed in 2 weeks.—*Duration of Treatment*, 6 weeks; *Result*, cured.

60 (xvii.). *Admitted* Sept. 27, 1866. Age 29. Age at marriage 19. No. of children 6.

History. Labor terminated naturally in 48 hours; nothing of note during its progress; 2 days after, the urine began to escape.—*Extent of Lesion.* Transverse fistula in front of the cervix, which had sloughed away; by bands extending into the cul-de-sac, the vaginal tissue in front of the cervix was drawn into a fold so as to hide the opening into the bladder.—*Treatment.* The fold was freed, so as to bring the fistula into view; its edges were very thin, so that the vaginal tissue was also denuded; closed by 10 sutures; removed on the 10th day.—*Duration of Treatment*, 4 weeks; *Result*, cured.

61 (xix.). *Admitted* Oct. 1, 1866. Age 28. Age at marriage 19. No. of children 5.

History. In labor 48 hours: delivered by forceps; 2 weeks afterwards the urine began to escape; made a tedious recovery.—*Extent of Lesion.* Sloughing of the anterior lip and a portion of the base of the bladder, in front of the cervix, took place; by shortening of the vagina, its anterior wall became doubled on itself, so as to form a fold which hid the fistula.—*Complications.* Laceration of the posterior lip backwards, with subsequent pelvic cellulitis and retroversion of the uterus.—*Treatment.* The operation was a very difficult one, as the fistula could not be brought into view; closed chiefly by the sense of touch; occupied two hours.—*Duration of Treatment*, 10 weeks; *Result*, cured.

62. *Admitted* Oct. 17, 1866. Age 24. Age at marriage 18. No. of children 4.

History. In last labor 30 hours: natural delivery; no further particulars given.—*Extent of Lesion.* Two-thirds of the lower portion of the base of the bladder was lost, leaving a transverse fistula from ramus to ramus.—*Treatment.* 4 operations.—*Duration of Treatment*, 16 weeks; *Result*, cured.

63. *Admitted* Nov. 19, 1866. Age 30. Age at marriage 29. No. of children 1.

History. In natural labor 48 hours; no further particulars given.—*Extent of Lesion.* Originally had lost the whole base of the bladder, but from firm traction of cicatricial bands opening became oblique and was one inch and a half in length and an inch wide.—*Complications.* Urethra occluded.—*Treatment.* 5 operations; one for division of bands, one to open the urethra, and three to close the fistula.—*Duration of Treatment*, 1 year; *Result*, improved.—*Remarks.* A small opening left; she did not return, and it was doubtless closed by some one else.

64 (v.). *Admitted* Nov. 26, 1866. Age 36. Age at marriage 26. No. of children 4.

History. Injured in the last labor, 5 weeks previous to admission; 48 hours in labor and delivered by "traction;" stillborn; loss of urine from time of delivery.—*Extent of Lesion.* A fistula in the median line extending an inch and a quarter from the cervix towards the neck of the bladder, and had resulted from a laceration of the anterior lip of the cervix; the fissure was deeper in the uterine canal than on a line with the opening through the vaginal septum.—*Treatment.* First operation successful; on the day after removal of sutures jumped out of bed from fright, and the urine was found to escape from the os uteri; reproduced the condition at the time of laceration, with a successful result.—*Duration of Treatment*, 13 weeks; *Result*, cured.

65 (L.). *Admitted* Jan. 19, 1867. Age 36. Age at marriage 19. No. of children 1.

History. In labor 48 hours, and delivered by forceps: child stillborn; no recollection in regard to emptying the bladder; the urine began to escape at the end of first week. Injured fifteen years.—*Extent of Lesion.* The whole base of the bladder was found to have been lost and the cul-de-sac and the vagina shortened to an inch and a half in depth.—*Complications.* The vaginal outlet contracted b a slough behind the perineum so that the finger could not be introduced.—*Tre ment.* The vagina was opened to the depth of three inches and the fistula close shortly after the sutures had been removed, an opening was found behind t right ramus; 15 sutures used at first and 5 afterwards.—*Duration of Treatment*, weeks; *Result*, cured.

66. *Admitted* Jan. 24, 1867.

History. No record.—*Extent of Lesion.* A fistula admitting the finger situated in front of the cervix and caused by an anterior laceration.—*Treatment.* 1 operation; 6 sutures; removed 12th day.—*Duration of Treatment*, 5 weeks; *Result*, cured.

67 (LXI.). *Admitted* Feb. 4, 1867. Age 38. Age at marriage 27. No. of children 2.

History. In labor 62 hours: delivered by forceps; stillborn; the bladder was not emptied; urine escaped from time of delivery.—*Extent of Lesion.* The whole base of the bladder lost, but the opening became greatly reduced in size by contraction.—*Complications.* Cicatricial tissue shortening the vagina.—*Treatment.* 2 operations; the first with 10 sutures failed from traction; band divided; second operation successful, with 9 sutures.—*Duration of Treatment*, 10 weeks; *Result*, cured.—*Remarks.* Fistula had been closed before admission, but opened from traction of bands.

68 (XXIV.). *Admitted* March 5, 1867. Age 38. Age at marriage 18. No. of children 5.

History. Natural labor 56 hours: bladder had been frequently emptied; urine began to escape on the 9th day.—*Extent of Lesion.* Loss of the anterior lip of the cervix and upper third of the base of the bladder; the vaginal tissue was drawn backward like a hood, so as to hide the fistula.—*Treatment.* The fistula was closed, but no union took place, as its edges were cicatricial; second operation successful by cutting out the surrounding tissue, and bringing together healthy surfaces.—*Duration of Treatment*, 7 weeks; *Result*, cured.

69 (XLIX.). *Admitted* April 5, 1867. Age 34. Age at marriage 32. No. of children 1.

History. No labor pains: delivered by forceps six days after rupture of the membranes; the bladder was not emptied, although the attempt was made; loss of urine from delivery; confined to bed 4 months when she was admitted to the Hospital.—*Extent of Lesion.* The vagina was narrowed at the depth of an inch and a half, a transverse fistula beyond, with perfect occlusion of the canal at the posterior edge of the opening; the vagina was opened for over three inches in depth without detecting the position of the uterus.—*Treatment.* The fistula into the bladder was closed after two operations, by bringing together the tissue along the axis of the vagina in two folds and shutting up the fistula at the bottom of a pouch.—*Duration of Treatment*, 23 weeks; *Result*, cured.

70 (XXV.). *Admitted* April 12, 1867. Age 27. Age at marriage 23. No. of children 3.

History. In labor 46 hours: delivered by forceps; stillborn; bladder was emptied; loss of urine 2 weeks after delivery. Injured ten months before admission.—*Extent of Lesion.* Loss of the anterior lip of the cervix and upper portion of the base of the bladder; by contraction, the vaginal tissue was drawn laterally into two folds over the cervix and fistula, and these extended in the long axis of the canal, from the cul-de-sac nearly to the neck of the bladder.—*Treatment.* These bands were dissected off from the posterior lip, so that the fistula was brought into view and easily closed by 9 sutures; removed the 11th day.—*Duration of Treatment*, 4 weeks; *Result*, cured.

71 (LXII.). *Admitted* April 27, 1867. Age 18. Age at marriage 16. No. of children 1.

History. The head was born at the end of 74 hours: pains then ceased; body delivered 15 hours after by traction; stillborn; the bladder had not been emptied for 48 hours previous to delivery; 4 days after, it began to escape.—*Extent of Lesion.* The urethra was lacerated entirely through, half an inch from the meatus; the distal portion of the canal was so dilated that a large portion of the mucous membrane protruded.—*Treatment.* The difficulties of the operation consisted in passing the sutures so as to bring perfectly into apposition the two sections of the canal, of different diameters; one operation successful.—*Duration of Treatment*, 5 weeks; *Result*, cured.

72. *Admitted* Oct. 16, 1867. Age 40. No. of children 1.

History. Was delivered by forceps of a living child one year after marriage; urine was lost from time of delivery; was confined to bed for six months.—*Extent of Lesion.* Anterior lip and base of the bladder lacerated down to the left ramus; a portion of the cervix had sloughed; by contraction, the fistula and remains of the cervix were left at the bottom of a deep sulcus; it was with great difficulty that the cervix could be brought into view.—*Complications.* Partial atresia of the vagina.—*Treatment.* 3 operations: one to divide bands; first operation closed the fistula by following the crest of the fold, thus covering over the os in communication with the bladder; small opening closed by second operation: not entirely successful.—*Duration of Treatment*, 8 months; *Result*, improved.—*Remarks.* An opening left admitting a probe; never returned to have this closed, as it was done at home.

73. *Admitted* Oct. 20, 1867. Age 34. Age at marriage 32. No. of children 1.

History. In labor 48 hours: forceps; bladder not emptied.—*Extent of Lesion.*—Fistula at the neck of the bladder one inch in diameter, and extended across the vagina.—*Treatment.* Closed by two operations.—*Duration of Treatment*, 8 weeks; *Result*, cured.

74. *Admitted* Nov. 5, 1867. Age 43. Age at marriage 14. No. of children 13; of miscarriages 1.

History. With the eleventh child labor lasted three days: forceps; child weighing 14 pounds; bladder emptied several times; loss of urine from 3d day after delivery.—*Extent of Lesion.* A laceration along the right side of the vagina from the cervix to the right ramus; somewhat crescentic in shape; the edge of the fistula behind the bone had a sloping surface, while that above was abrupt: this made the opening into the bladder much smaller than at the beginning.—*Treatment.* First operation used 16 sutures; small opening left behind the ramus; second operation on the knees and elbows; freed the parts from the bone; 7 sutures; successful.—*Duration of Treatment*, 4 months; *Result*, cured.

75. *Admitted* Nov. 17, 1867. Age 37. No. of children 1.

History. In labor 48 hours: delivery by forceps.—*Extent of Lesion.* Fistula in front of the cervix admitting the index finger; the result of laceration through the anterior lip.—*Complications.* Mania after confinement.—*Treatment.* 2 operations; unable to control the patient.—*Duration of Treatment*, 8 weeks; *Result*, not improved.

76 (XXXI.). *Admitted* Nov. 28, 1867. Age 37. Age at marriage 28. No. of children 5; of miscarriages 1.

History. Delivered by version after a labor of 8½ hours; child stillborn; on the day after delivery the urine began to escape.—*Extent of Lesion.* The vagina was unusually deep; found no cervix, but two openings in the median line, high up in the vagina, which led into the bladder, with a septum between them about half an inch in width; this septum was divided, when it was ascertained that the fistula was situated in front of the remains of the cervix; the edges of the opening were cicatricial and the loss of tissue had been extensive.—*Complications.* The uterus was retroverted and fixed.—*Treatment.* From the neck of the bladder to the cul-de-sac a denuded line extended in the form of an ellipsis; then the intervening tissue was removed so as to leave no pouch; these surfaces were brought together by 17 sutures, making a line of three inches.—*Duration of Treatment*, 6 weeks; *Result*, cured.—*Remarks.* Had been operated on 9 times before admission.

77. *Admitted* Nov. 28, 1867. Age 37. Age at marriage 32. No. of children 3.

History. In the first labor 3 days, without pain: delivered by forceps of a stillborn child; chloroform; did not know when the urine began to escape; passed a large stone from the bladder a week after delivery; several months getting well; had two stillborn children since. Injured four years.—*Extent of Lesion.* The whole base of the bladder was lost, from the cervix to the urethra; behind the left ramus the bone was denuded.—*Treatment.* First operation all was closed but the angle behind the ramus; this was left; done on the knees and elbows; 15 sutures used; opening behind the ramus dissected off and closed with 7 sutures;

afterwards 2 operations to close small openings made by traction; from the last operation there remained a pin-hole, which closed by contraction.—*Duration of Treatment*, 18 months; *Result*, cured.

78. *Admitted* Dec. 20, 1867. Age 29. Age at marriage 25. No. of children 1; of miscarriages 2.

History. Was in labor 180 hours: several days without pain after rupture of the membranes; delivered by hand; stillborn; could give no information regarding the bladder; urine began to escape two weeks after delivery; confined to bed two months; two miscarriages since. *Extent of Lesion*. There had been great loss of tissue, but by contraction the opening was reduced in size to admit the index finger, and was situated in the centre of the base of the bladder.—*Complications*. Cicatricial tissue.—*Treatment*. It was necessary to remove so much of the surrounding tissue with the edges of the fistula that the opening was a very large one; closed by 9 sutures.—*Duration of Treatment*, 4 weeks; *Result*, cured.

79. *Admitted* Jan. 7, 1868. Age 25. Age at marriage 19. No. of children 2.

History. In labor 78 hours: delivered by forceps; escape of urine two days after delivery.—*Extent of Lesion*. Loss of the base of the bladder, the cervix, and cul-de-sac; vagina shortened to one inch in depth; a fistula remained, extending from one ramus to the other, with its edges lying in contact; but little tissue covering the bones.—*Complications*. Uterus retroverted and bound down.—*Treatment*. An attempt to open the vagina was followed by an abscess; afterwards enough had been gained to close the fistula with 11 sutures; 4 operations afterwards to close an opening in the median line only large enough to admit a blunt hook; all cicatricial tissue, and opened after removal of the sutures.—*Duration of Treatment*, 12 months; *Result*, improved.—*Remarks*. Never returned; opening may have closed by contraction of cicatricial tissue.

80. *Admitted* Jan. 26, 1868. Age 29. Age at marriage 17. No. of children 2; of miscarriages 1.

History. In labor 78 hours: stillborn; the body remained undelivered 36 hours after passage of the head; physician then called in, who removed the body by traction; escape of urine from the birth; 5 months in bed; one child since at 7 months, which was removed by forceps.—*Extent of Lesion*. Great loss of tissue involving cervix and base of the bladder; slough of the perineum; tissues all lost behind the left ramus.—*Complications*. Cicatricial tissue filling the cul-de-sac.—*Treatment*. Required very extensive dissection and removal of cicatricial tissue; 2 operations necessary: one to close the fistula to the ramus; then a flap was taken from the lateral wall to cover the opening behind the bone.—*Duration of Treatment*, 6 weeks; *Result*, cured.—*Remarks*. Had 5 operations previous to admission.

81 (LXXV.). *Admitted* Jan. 30, 1868. Age 35. Age at marriage 33. No. of children 1.

History. In labor 123 hours: delivered with forceps; stillborn; two days after delivery lost control of the urine; for a month it was thought that she would die. —*Extent of Lesion*. Vagina shortened; cervix and posterior cul-de-sac lost; in the mass of cicatricial tissue the os could not be found, or any remains of the cervix except a hard mass, thought to be the posterior lip; it was only when on the knees and elbows that the fistula could be brought into view; by contraction, the fistula was drawn to one side and somewhat behind the uterus.—*Complications*. Uterus retroverted and fixed in the pelvis from a general cellulitis after labor.—*Treatment*. After some dissection in the cul-de-sac, the transverse fistula was closed by 8 sutures in the axis of the vagina; two weeks after, a small opening formed; while freeing the parts for the second operation, cut into the peritoneal cavity; no bad result, and was closed with the fistula by the same operation.—*Duration of Treatment*, 18 weeks; *Result*, cured.

82. *Admitted* Feb. 10, 1868. Age 28. Age at marriage 24. No. of children 3.

History. In labor 55 hours: delivered by forceps; the bladder was emptied frequently; the urine began to escape a week after delivery.—*Extent of Lesion*. There was a laceration of the cervix through the vaginal wall to the neck of the bladder, which closed from above downward through the cervix; the whole neck of the uterus sloughed.—*Complications*. The uterus was retroverted and bound down by adhesions from an old cellulitis.—*Treatment*. In consequence of the adhesions, the sides could not be brought together, nor could they be freed by dissection, and were therefore united by 8 sutures transverse to the axis of the vagina.—*Duration of Treatment*, 8 weeks; *Result*, cured.

83. *Admitted* Feb. 25, 1868. Age 31. Age at marriage 23. No. of children 1.
History. In labor 60 hours: ergot; delivered by forceps; bladder emptied frequently. *Extent of Lesion*. Loss of the base and neck of the bladder, with a portion of the urethra; fistula from one ramus to the other; prolapse of the fundus of the bladder through the opening.—*Complications*. Partial atresia of the vagina.—*Treatment*. 2 operations; the bands were divided and a glass plug used for several months; first operation on the knees and elbows; 5 sutures; small opening closed by a second operation, using 5 sutures.—*Duration of Treatment*, 6 months; *Result*, cured.

84. *Admitted* Feb. 29, 1868. Age 35. No. of children 6; of miscarriages 1.
History. In labor 53 hours: failed to apply the forceps; craniotomy; child weighed 9½ pounds; the bladder was not emptied; urine began to escape on the following day. Injured four years before admission.—*Extent of Lesion*. Fistula in front of the neck of the uterus extending the width of the vagina; the opening had been circular, but now drawn into a crescentic shape by bands filling the posterior cul-de-sac; the fundus of the bladder protruded through the fistula.—*Complications*. The anterior lip sloughed away; the os was occluded and could not be found; retained menstrual blood.—*Treatment*. Evacuated the uterine cavity; the bands were dissected up so as to free the angles of the fistula; this was closed with great difficulty on account of the loss of the cervix; 18 sutures; the line being three inches long.—*Duration of Treatment*, 4 weeks; *Result*, cured.

85. *Admitted* March 1, 1868. Age 35. Age at marriage 33. No. of children 1.
History. In labor 4 days and delivered with forceps; no further particulars.—*Extent of Lesion*. Large fistula in front of the neck of the uterus; portion of the cervix destroyed.—*Complications*. Cicatricial tissue.—*Treatment*. 2 operations.—*Duration of Treatment*, 3 months; *Result*, cured.

86. *Admitted* March 11, 1868. Age 33. Age at marriage 24. No. of children 2.
History. In labor 20 hours: natural delivery; bladder not emptied for 36 hours. *Extent of Lesion*. Fistula half an inch in diameter and just in front of the cervix.—*Treatment*. One operation; failed in consequence of menstruation coming on immediately after the operation.—*Duration of Treatment*, 4 weeks; *Result*, not improved.—*Remarks*. Never returned.

87. *Admitted* March 24, 1868. Age 27. Age at marriage 23. No. of children 6; of miscarriages 2.
History. In labor 34 hours: natural delivery; child weighed 13 pounds; face presentation; stillborn; urine began to escape on the 13th day.—*Extent of Lesion*. Fistula oval shaped; entire base of the bladder had been lost; sloughing in the posterior cul-de-sac.—*Complications*. Mouth of the right ureter in the edge of the fistula.—*Treatment*. One operation to divide bands, the other to close the fistula: 21 sutures used.—*Duration of Treatment*, 7 weeks; *Result*, cured.—*Remarks*. After her discharge, a small opening made by traction; this was closed afterwards by 7 sutures.

88 (LXXIII.). *Admitted* April 8, 1868. Age 27. Age at marriage 23. No. of children 1.
History. In labor 103 hours: failed in the attempt to apply the forceps; delivered by craniotomy; the bladder was not emptied until just before delivery; urine afterwards retained for a week, when it suddenly escaped in large quantity: did not recover for several months.—*Extent of Lesion*. A fistula situated in the median line and centre of the base of the bladder; the opening was circular and half an inch only in diameter; it had been caused by a laceration of the anterior lip of the uterus, which had extended along the base of the bladder for some distance beyond the lower edge of the present opening.—*Complications*. On admission still complained of numbness in the right foot.—*Treatment*. After removing the cica-

tricial edges of the fistula into healthy tissue, it was closed without difficulty by 6 sutures, making a line of union an inch and a quarter in length; without any apparent cause, an attack of peritonitis developed on the 4th day; this subsided, and union found perfect when the sutures were removed; on the 35th day symptoms of pyæmia, and she died six weeks after the operation.—*Duration of Treatment*, 6 weeks; *Result*, died.—*Remarks*. Had been operated on previous to admission.

89. *Admitted* April 15, 1868. Age 33. Age at marriage 29. No. of children 2.
History. In labor 42 hours: forceps; loss of urine 20 days after delivery. Injured five months.—*Extent of Lesion*. Loss of the upper half of the bladder; the vagina shortened by contraction, and the fistula hidden by the tissues in front of the neck of the bladder; a fold was drawn back by cicatricial tissue in the cul-de-sac.—*Treatment*. Until the bands were divided the fistula seemed a small one; it was then transverse and admitted two fingers; first operation very difficult; 11 sutures; two small openings left; closed as one by 7 sutures.—*Duration of Treatment*, 10 weeks; *Result*, cured.

90. *Admitted* May 4, 1868. Age 34. Age at marriage 24. No. of children 4.
History. In labor 34 hours: chloroform, forceps; bladder not emptied; lost the urine on the 5th day.—*Extent of Lesion*. Fistula in front and a little to the left of the neck of the uterus, half an inch in diameter; there had been an adhesion in the walls of the vagina, shutting up the neck of the uterus; mouth of the pelvic abscess near the edge of this septum; the fistula was drawn behind the right ramus.—*Complications*. As the result of an examination before admission, she had cellulitis and a pelvic abscess.—*Treatment*. Operation difficult, as the parts were unyielding from the old cellulitis; difficulty with the catheter; operation only partially successful; second operation, with 11 sutures, successful.—*Duration of Treatment*, 13 weeks; *Result*, cured.

91. *Admitted* June 1, 1868.
History. No record.—Fistula admitting two fingers, situated in front of the anterior lip, which sloughed; had been a laceration through the anterior lip and in the vaginal axis, but made transverse by cicatricial tissue on each side of the cervix.—*Treatment*. 2 operations: one for opening the cul-de-sac, and the other for closing the fistula.—*Duration of Treatment*, 11 weeks; *Result*, cured.

92. *Admitted* Oct. 5, 1868. Age 34. Age at marriage 23. No. of children 8.
History. In labor 60 hours: ergot, forceps; child large and stillborn; bladder emptied.—*Extent of Lesion*. Laceration of the cervix through the anterior lip and base of the bladder; closed from above, leaving a sinus into the uterine canal above the vaginal junction.—*Treatment*. With scissors produced the original condition; removed the tract of the sinus and closed the lips with 4 sutures, which were removed on the 9th day.—*Duration of Treatment*, 6 weeks; *Result*, cured.

93. *Admitted* Oct. 9, 1868. Age 28. Age at marriage 20. No. of children 1.
History. In labor 48 hours: breech presentation; weighed 12 pounds; urine escaped from the time of delivery.—*Extent of Lesion*. Nothing left of the base of the bladder; tissue gone from behind the rami; inversion of the bladder through the fundus.—*Complications*. Loss of the entire urethra.—*Treatment*. 10 operations during four years, during which time the fistula was bridged over to a small opening, and a new urethra was made.—*Result*, improved.

94. *Admitted* Oct. 17, 1868. Age 24. Age at marriage 18. No. of children 4.
History. In labor 30 hours: delivered by efforts of nature, stillborn; urine began to escape on the 4th day. Injured four months.—*Extent of Lesion*. The fistula extended from one ramus to the other and involved a loss of at least two-thirds of the base of the bladder; it was drawn into shape so that its corners were square.—*Treatment*. Closed by 4 operations, the first one requiring 15 sutures.—*Duration of Treatment*, 5 months; *Result*, cured.

95. *Admitted* Oct. 19, 1868. Age 33. Age at marriage 20. No. of children 3.
History. In labor 30 hours: after the pains had ceased, the body was "delivered by hand," stillborn; the bladder was emptied; urine escaped shortly after

[illegible]—*Extent of Lesion.* At the depth of an inch and a half from the outlet [illegible] terminated along the posterior edge of the fistula; the finger passed [illegible] to the bladder: the fistula was transverse from one side of the vagina to [illegible].—*Complications.* Atresia of the vagina.—*Treatment.* The vagina opened [illegible] depth of four inches, and a glass plug worn for three months; in consequence [illegible] the cicatricial tissue, 5 operations were necessary before the fistula [illegible].—*Duration of Treatment*, 4 months; *Result*, cured.

[illegible] *Admitted* Oct. 23, 1868. Age 35. Age at marriage 23. No. of children 1. *History.* In labor 72 hours: forceps used; urine began to escape a week after [illegible]. Injured eleven years before admission.—*Extent of Lesion.* The whole [illegible] bladder and all but a quarter of an inch of the urethra was lost; the vagina was constricted at two points; at the first the finger could be passed, but [illegible] into the bladder.—*Complications.* Atresia of the vagina.—*Treatment.* The vagina was opened, and a glass plug worn for two months; fistula closed by [illegible] and was 3½ inches long; only a small opening left just behind the left [illegible] operations afterwards for closing small opening.—*Duration of Treatment*, [illegible]; *Result*, cured.—*Remarks.* As the line contracted, the urine would sometimes escape, from the short urethra, when walking.

[illegible] *Admitted* Oct. 27, 1868. Age 20. Age at marriage 18. No. of children 1. *History.* In labor 96 hours: delivered by forceps; no information in regard to [illegible] the bladder, but the urine escaped from the time of delivery.—*Extent of Lesion.* Loss of the base of the bladder, cul-de-sac, and neck of the uterus; [illegible] shortened and contracted with a transverse fistula at the neck of the [illegible].—*Complications.* Curvature of the spine and deformed pelvis, with atresia [illegible] bladder.—*Treatment.* In consequence of the narrowed pelvis, the atresia was allowed to remain so as to prevent a future pregnancy; the fistula was closed [illegible] sutures.—*Duration of Treatment*, 8 weeks; *Result*, cured.

[illegible] *Admitted* Dec. 1, 1868. Age 30. Age at marriage 18. No. of children 3. *History.* In labor 72 hours: delivered by forceps; stillborn, large child; urine escaped on delivery. Injured three years before admission.—*Extent of Lesion.* A [illegible] one inch and a quarter in length, situated just in front of the cervix and [illegible] to the left; the opening is transverse to the axis of the vagina and in the [illegible] of cicatricial tissue.—*Treatment.* Fistula closed by 13 sutures; successful. [illegible] days after began to lose the urine; small opening closed by 8 sutures. [illegible] another operation with 7 sutures; successful.—*Duration of Treatment*, 5 months; *Result*, cured.

[illegible] *Admitted* Dec. 23, 1868. Age 49. Age at marriage 21. No. of children 10. [illegible] miscarriages 1. *History.* In labor 60 hours: had puerperal convulsions; delivered with forceps. [illegible] urine from time of delivery. Injured four years before admission; still-born. *Extent of Lesion.* Laceration of the cervix on the left side, which passed [illegible] the vaginal wall; the opening is at the bottom of a deep sulcus passing obliquely from right to left, and extended from the internal os into the bladder; [illegible] was difficult to bring the parts into view.—*Complications.* Puerperal mania.—*Treatment.* 2 operations; after each the puerperal mania was developed, and it was impossible to keep her quiet; her general health was worse at the time of her discharge, but the opening was smaller.—*Duration of Treatment*, 4 months; *Result*, improved.

[illegible] *Admitted* April 24, 1869. Age 35. Age at marriage 25. No. of children 4. *History.* In labor 72 hours: delivered by the efforts of nature; child in a state of decomposition; escape of urine one week after delivery.—*Extent of Lesion.* A fistula existed behind a contraction of the vagina; when this had been opened, the fistula was found half an inch in front of the cervix, transverse to the axis of the vagina, and large enough to admit two fingers.—*Complications.* Partial atresia of the vagina.—*Treatment.* Certain bands were divided to free the edges; these were secured by 14 sutures; the parts had united when the sutures were removed, but on the day after jumped out of bed, and twice afterwards the parts separated, but finally closed.—*Duration of Treatment*, 12 months; *Result*, cured.

101. *Admitted* May 6, 1869. Age 36. Age at marriage 25. No. of children 5; of miscarriages 1.

History. Second labor lasted 48 hours: terminated by forceps; urine escaped 4 days after delivery; three children born since.—*Extent of Lesion.* Originally the laceration extended through the anterior lip to within an inch of the neck of the bladder, and then turned towards and as far as the left ramus.—*Treatment.* This case had been operated on before admission, and about half from each end had been closed; the remaining opening was closed by 6 sutures.—*Duration of Treatment*, 4 weeks; *Result*, cured.—*Remarks.* Had been operated on with benefit previous to admission.

102. *Admitted* May 7, 1869. Age 38. Age at marriage 20. No. of children 5.

History. In labor 17 hours: attempted to deliver with forceps, then version, and delivery finished by craniotomy, under ether; the head was very large; it was said that the head was impacted only one hour; the urine escaped one month after. Injured one year before admission.—*Extent of Lesion.* A laceration originally extended through the anterior lip of the cervix and along the median line into the base of the bladder; the tear through the cervix closed, leaving the opening in the base of the bladder.—*Treatment.* A V-shaped piece was removed from the cervix before the fistula could be closed; this was done by 7 sutures.—*Duration of Treatment*, 9 weeks; *Result*, cured.

103. *Admitted* Oct. 13, 1869. Age 24. Age at marriage 22. No. of children 1.

History. In labor 61 hours: delivered with forceps; child stillborn; three days after delivery the urine began to escape; confined to bed for three months.—*Extent of Lesion.* An opening high up behind the symphysis, and difficult to bring into view; the opening is but three-quarters of an inch in length, and in the midst of cicatricial tissue.—*Complications.* In the habit of taking large quantities of morphine; extensive laceration of the perineum.—*Treatment.* After the cicatricial tissue had been removed, the opening was two inches and a half in length.—*Duration of Treatment*, 12 weeks; *Result*, cured.

104. *Admitted* Oct. 14, 1869. Age 30. Age at marriage 19. No. of children 6; of miscarriages 2.

History. In labor 22 hours: delivered by forceps; urine escaped from time of delivery.—*Extent of Lesion.* Loss of the base and neck of the bladder, but the sides had become united so as to leave two openings: one just anterior to the cervix and the other directly behind the pubes, at which point the urethra is closed.—*Complications.* Fistula of the left ureter; recto-vaginal fistula; occlusion of the urethra.—*Treatment.* The openings into the bladder were closed by two separate operations without difficulty; some urine was lost when the small fistula in the ureter was found; several operations were performed to close this, but without success.—*Duration of Treatment*, 4 months; *Result*, cured.—*Remarks.* Both vesical and rectal fistulæ were closed; died afterwards of renal disease.

105. *Admitted* Oct. 19, 1869. Age 30. Age at marriage 20. No. of children 1.

History. In labor 48 hours: no interference; no control of urine after delivery.—*Extent of Lesion.* Base of the bladder and the urethra destroyed.—*Treatment.* 14 operations, six of which were for reconstruction of the urethra.—*Duration of Treatment*, 18 months; *Result*, not given.

106. *Admitted* Oct. 26, 1869. Age 28. No. of children 7; of miscarriages 1.

History. In labor 48 hours: craniotomy; six days after delivery urine began to escape.—*Extent of Lesion.* Base of the bladder and anterior lip of the uterus lost; the fistula is over two inches in length and extends from ramus to ramus; these bones were denuded of all tissue but the periosteum.—*Complications.* Prolapse of the posterior wall and fundus of the bladder.—*Treatment.* Required extensive dissection to bring the parts together without making traction on the short urethra; the line of union was three inches long and brought together by 18 sutures.—*Duration of Treatment*, 4 months; *Result*, cured.—*Remarks.* Required three months of preparatory treatment.

delivery.— [illegible] marriage 22. No. of children 2.
the vagina [illegible] forceps; stillborn; urine escaped
directly [illegible] Laceration through the anterior lip
the other [illegible] small opening at the vaginal junction.
up to the [illegible] shaped piece from the cervix to prevent
sequence [illegible] then united by 8 sutures.—*Duration of*
closed.— [illegible]

96. *Ad.* [illegible] ge at marriage 26. No. of children 1
Hist. [illegible]
delivery [illegible] vered by forceps; urine began to escape [illegible]
base of [illegible] years.—*Extent of Lesion.* Fistula in [illegible]
vagina [illegible] of the bladder and cervix uteri; the [illegible]
only [illegible] er, but there had been a greater loss of tissue
The [illegible] stitis, which required several months' tre-
17 su [illegible] *atment.* The fistula was closed by 7 sutures,
ramu [illegible] which required 4 months.—*Duration of Treat-*
6 m [illegible] *marks.* Had been operated on previous to
some [illegible]

97. [illegible] 31. Age at marriage 29. No. of children 1.
Hi. [illegible] pains ceased and head on the perineum for 24
em [illegible] marked effect; delivered by traction; stillborn; [illegible]
L. [illegible]—*Extent of Lesion.* Loss of the middle third of the
va [illegible] from one side of the vagina to the other.— [illegible]
bl [illegible] of the perineum.—*Treatment.* Three months' pre-
o [illegible] operation successful, but a week after removing the
w [illegible] time; small opening behind the ramus, closed by a
w [illegible] *Treatment*, 3 months; *Result*, cured.—*Remarks.* Had
[illegible] without trouble.

[illegible] 70. Age 43. Age at marriage 20. No. of children 11.
[illegible] ears: head impacted for 24 hours; stillborn; delivered
[illegible] time of delivery. Injured six years.—*Extent of Lesion.*
[illegible] the cervix, hidden by folds and closed with great diffi-
[illegible] the urine escaping from the os uteri; there had been a
[illegible] the body and cervix in the median line, which partly
[illegible] required five months of preparatory treatment; after the
[illegible] urine escaped from the os; as the opening into the bladder
[illegible] and on account of her age, it was thought best to close the
[illegible] sed.—*Duration of Treatment*, 11 weeks; *Result*, cured.

[illegible] 8, 1870. Age 31. Age at marriage 17. No. of children 1.
[illegible] 30 hours, when delivery was accomplished with forceps; the
[illegible] 8 days after delivery; injured seven months.—*Extent of*
[illegible] an inch in diameter, situated at the neck of the bladder, was
[illegible] cicatricial bands, which narrowed the vagina; beyond the
[illegible] was destroyed.—*Complications.* Atresia of the vagina, and
[illegible] *Treatment.* It required four months to open the vagina, during
[illegible] plug was used; fistula closed by 8 sutures; operation suc-
[illegible] short time, began to lose urine, due to a band pulling the urethra
[illegible] removing this band the retentive power was gained.—*Duration of*
[illegible] months; *Result*, cured.

[illegible] April 20, 1870. Age 19. Age at marriage 17. No. of children 1.
[illegible] labor 93 hours; delivered by forceps; escape of urine from time
[illegible] injured a year previous to admission.—*Extent of Lesion.* A fistula
[illegible] the whole base of the bladder, and extended from one ramus to
[illegible] *Treatment.* 3 operations: first, 11 sutures used; closed all but at the
[illegible] bladder, where the catheter came in contact; next operation again
[illegible] a band which drew the neck of the bladder backward; after
[illegible] remained closed.—*Duration of Treatment*, 8 months; *Result*,

113. *Admitted* June 14, 1870. Age 33. Age at marriage 15. No. of children 3.
History. Last labor, terminated by forceps; loss of urine since delivery; no further particulars given.—*Extent of Lesion.* A small opening at the neck of the bladder.—*Treatment.* 1 operation; 5 sutures.—*Duration of Treatment,* 8 months; *Result,* cured.

114. *Admitted* Sept. 22, 1870. Age 43. No. of children 1.
History. Labor difficult: time not given; delivered with forceps; escape of urine from delivery.—*Extent of Lesion.* A crescentic shaped fistula from the loss of the lower half of the base of the bladder; the corners were drawn up by bands on each side of the cervix.—*Treatment.* First operation, 13 sutures; small opening; this was closed by a second operation; again opened and finally closed by a third operation.—*Duration of Treatment,* 3 months; *Result,* cured.

115. *Admitted* Oct. 4, 1870. Age 35. Age at marriage 27. No. of children 1.
History. In labor 36 hours: forceps failed: craniotomy afterwards; escape of urine from delivery. Injured fourteen years.—*Extent of Lesion.* Loss of the upper third of the anterior wall of the vagina, the upper edge of which was formed by the cervix.—*Treatment.* A V-shaped piece was removed from the cervix, and the edges of the fistula brought together with 6 sutures; when these were removed, there was no union; a second operation, after some preparatory treatment, was successful.—*Duration of Treatment,* 22 weeks; *Result,* cured.—*Remarks.* Twice operated on previous to admission.

116. *Admitted* Oct. 4, 1870. Age 26. Age at marriage 24. No. of children 1.
History. In labor 4 days: delivered with forceps; stillborn; has had a loss of urine since her delivery. Injured five months.—*Extent of Lesion.* Loss of the middle third of the anterior wall; the fistula extended from one side of the vagina to the other, and of a crescentic shape from bands on each side of the cervix extending into the cul-de-sac.—*Treatment.* Three months preparatory treatment; the cicatricial bands were divided, the edges of the fistula denuded and brought together by 13 sutures; small opening in the midst of cicatricial tissue; second operation, no union; 6 operations more before it was closed.—*Duration of Treatment,* 19 months; *Result,* cured.—*Remarks.* Had phlebitis along the course of the femoral vessels on the right side, after the second operation.

117. *Admitted* Oct. 5, 1870. Age 45. Age at marriage 30. No. of children 5; of miscarriages 3.
History. No particulars given beyond the statement that the last labor was a very difficult one and occurred four years previous to admission.—*Extent of Lesion.* A fistula formed by the sloughing of the upper third of the anterior wall of the vagina, together with the neck of the uterus along the lower edge; more of the vaginal surface had sloughed than from the base of the bladder, so that the edge was slanting; on the upper side the tissue were gone as far as the cervix, and the remains of the cervix projected into the bladder.—*Complications.* Uterus retroverted.—*Treatment.* Cicatricial tissue covered a portion of the opening like a hood; from the position of the uterus, it was necessary to close the edges of the fistula over the cervix, leaving it in the bladder; this was done by 9 sutures.—*Duration of Treatment,* 9 weeks; *Result,* cured.—*Remarks.* Menstruated for the first time at 25 years of age.

118. *Admitted* Dec. 7, 1870. Age 43. Age at marriage 19. No. of children 11.
History. In last labor 36 hours: delivered by forceps; escape of the urine after delivery.—*Extent of Lesion.* Loss of the base of the bladder and cul-de-sac.—*Treatment.* 3 operations.—*Duration of Treatment,* 22 weeks; *Result,* cured.

119. *Admitted* Sept. 25, 1871. Age 33. Age at marriage 29. No. of children 3.
History. In labor 48 hours: breech presentation; delivered "by instruments," after version had been performed; the bladder was emptied during progress of labor, but not for several days after, when it began to escape by the vagina.—*Extent of Lesion.* The whole base of the bladder, including the neck and more than half the urethra, with loss of cul-de-sac; the inner face of the ramus on the left side was bared of all tissue; cicatricial bands on each side of the cervix, running into the cul-de-sac.—*Complications.* Had a rectal fistula which gradually

closed; urethra occluded.—*Treatment.* First operation after dividing the bands and opening the urethra; 10 sutures; two openings left; closed each by different operations, one of which had to be repeated.—*Duration of Treatment*, 9 months; *Result*, cured.—*Remarks.* Afterwards had a stone removed from the bladder.

120. *Admitted* Oct. 3, 1871. Age 33. Age at marriage 23. No. of children 1.
History. In labor 60 hours: stillborn; delivered by forceps; urine began to escape several days after delivery.—*Extent of Lesion.* Loss of the lower portion of the base of the bladder; after contraction, a transverse opening was left extending from ramus to ramus.—*Treatment.* There was so little tissue covering the left ramus that it was very difficult to denude the edges and to introduce the sutures; 13 sutures used; operation successful; afterwards a pin-hole opening was found against the left ramus; this closed by contraction.—*Duration of Treatment*, 9 months; *Result*, cured.

121. *Admitted* Oct. 6, 1871. Age 26. No. of children 1.
History. In labor 17 hours: delivered by forceps; bladder was not emptied; loss of urine since delivery; confined to bed 9 weeks.—*Extent of Lesion.* The entire base of the bladder lost, leaving the opening crescentic in shape, with the cornua backward; unable to find any vestige of the uterus left.—*Treatment.* The posterior wall of the vagina was united to the neck of the bladder; using 11 sutures; removed 12th day.—*Duration of Treatment*, 3 months; *Result*, cured.

122. *Admitted* Oct. 18, 1871. Age 34. Age at marriage 21. No. of children 8.
History. In the 7th labor was injured: lasted 17 hours, and terminated with forceps; bladder had to be emptied for two weeks, at the end of which time the urine was lost. Injured fifteen months.—*Extent of Lesion.* A small opening left in front of the cervix, the result of an anterior laceration.—*Complications.* Extensive laceration of the perineum.—*Treatment.* Fistula closed with 8 sutures.—*Duration of Treatment*, 4 weeks; *Result*, cured.

123. *Admitted* Oct. 21, 1871. Age 22. No. of children 1.
History. Labor 25 hours: delivered by craniotomy; loss of urine from time of delivery.—*Extent of Lesion.* Fistula in the median line near the cervix, large enough to admit the index finger.—*Treatment.* 2 operations: one to divide bands, and the other to close the fistula.—*Duration of Treatment*, 8 weeks; *Result*, cured.

124. *Admitted* Feb. 1, 1872. Age 28. Age at marriage 26. No. of children 1.
History. In labor 48 hours: delivered by forceps; bladder emptied only once during labor.—*Extent of Lesion.* Fistula an inch in diameter just in front of the cervix.—*Complications.* The whole vaginal surface covered by a phosphatic deposit.—*Treatment.* 1 operation, but it required months of preparatory treatment.—*Duration of Treatment*, 8 months; *Result*, cured.

125. *Admitted* Sept. 15, 1872. Age 28. Age at marriage 22. No. of children 1.
History. Not recorded.—*Extent of Lesion.* Fistula near the uterus, near the cervix, and half an inch in diameter.—*Treatment.* 1 operation; 6 sutures; removed the 10th day.—*Duration of Treatment*, 4 weeks; *Result*, cured.

126. *Admitted* Sept. 16, 1872.
History. Not recorded.—*Extent of Lesion.* Fistula to the left of the median line, extending to the side of the cervix, the result of a laceration.—*Treatment.* 2 operations.—*Duration of Treatment*, 7 months; *Result*, cured.

127 *Admitted* Sept. 21, 1872. Age 40. No. of children 1; of miscarriages 3.
History. Four days in labor: forceps: loss of urine from time of delivery. Injured three years; three miscarriages since.—*Extent of Lesion.* Cervix lacerated through the anterior lip into the bladder; the laceration remained unhealed.—*Treatment.* 1 operation; 8 sutures: 4 through the cervix and 4 through the fistula.—*Duration of Treatment*, 3 weeks; *Result*, cured.

128. *Admitted* Sept. 23, 1872.
History. Could get no information beyond the existence of the fistula for seven years.—*Extent of Lesion.* One fistula is immediately to the right of the median

line and half an inch from the cervix; another was found on the same side, near the ramus, as if the fistula had healed in the middle, leaving an opening at each end.—*Treatment.* One opening was closed with 6 sutures, and the other with 4. —*Duration of Treatment*, 3 months; *Result*, cured.

129. *Admitted* Sept. 23, 1872. Age 31. No. of children 1; of miscarriages 1.
History. In labor 3 days: was delivered with forceps; stillborn; 11 days after delivery involuntary escape of urine; miscarriage since birth of child.—*Extent of Lesion.* Laceration of the cervix, leaving an opening into the bladder close to the neck of the uterus.—*Treatment.* 1 operation; 6 sutures.—*Duration of Treatment*, 4 weeks; *Result*, cured.

130. *Admitted* Sept. 23, 1872. Age 26. No. of children 1.
History. In labor 24 hours: terminated by efforts of nature; stillborn; urine escaped at the end of a week.—*Extent of Lesion.* An opening existed at the neck of bladder which extended from bone to bone.—*Complications.* A recto-vaginal fistula.—*Treatment.* Before closing the fistula, the cicatricial bands in each angle were divided so as to free the corners from behind the rami; 6 sutures were used. —*Duration of Treatment*, 2 months; *Result*, cured.—*Remarks.* Rectal fistula closed afterward.

131. *Admitted* Sept. 24, 1872. No. of children 2.
History. Not recorded.—*Extent of Lesion.* A small opening, large enough to admit the uterine probe, found behind each ramus, without loss of tissue between. —*Complications.* An encysted stone in the bladder, which was not discovered until after closing the fistula.—*Treatment.* Each opening was closed by a separate operation; symptoms of cystitis gradually coming on after the operation, led to the discovery of the stone.—*Duration of Treatment*, 4 weeks; *Result*, cured.—*Remarks.* The stone was afterwards removed from the bladder.

132. *Admitted* Sept. 24, 1872. Age 30. Age at marriage 20. No. of children 1.
History. In labor 24 hours: no interference; no other particulars recorded.—*Extent of Lesion.* Loss of the whole anterior wall of the vagina.—*Treatment.* 1 operation.—*Duration of Treatment*, 4 months; *Result*, improved.—*Remarks.* Never returned; result unknown.

133. *Admitted* Nov. 21, 1872. Age 21. No. of children 1.
History. In labor 47 hours: delivered by craniotomy; the urine did not escape until the 13th day. Injured seventeen months.—*Extent of Lesion.* A fistula, directly in the base of the bladder, into which the finger could be introduced; dense cicatricial tissue on each side.—*Treatment.* The failure of previous operations was due to cicatricial traction; when the bands were divided the edges came together; 9 sutures used.—*Duration of Treatment*, 4 weeks; *Result*, cured.—*Remarks.* Had been operated on previous to admission.

134. *Admitted* Jan. 13, 1873. Age 28. No. of children 1.
History. In labor 36 hours: attempted to deliver with forceps, but failed; left to the efforts of nature; stillborn; the bladder had to be emptied by a catheter for three months after her confinement.—*Extent of Lesion.* Laceration entirely through the urethra, about one-third of an inch from the meatus; the desire was frequent to empty the bladder, and retention was difficult.—*Treatment.* By uniting the two sections of the urethra the constant drag on the neck of the bladder was relieved; the only difficulty of the operation was in adjusting accurately the two portions of the urethra.—*Duration of Treatment*, 4 weeks; *Result*, cured.

135. *Admitted* Feb. 5, 1873. Age 24. Age at marriage 21. No. of children 1.
History. In labor 48 hours: forceps; stillborn; large size; the bladder had been emptied by a catheter; two days after delivery the urine began to escape. Injured eight months.—*Extent of Lesion.* Fistula half an inch in diameter near the neck of the bladder, having cicatricial edges.—*Treatment.* Cause of failure due to the cicatricial edges; these were removed freely and brought together with 5 sutures.—*Duration of Treatment*, 4 weeks.—*Remarks.* Had been operated on previous to admission.

136. *Admitted* Sept. 11, 1873. Age 24. Age at marriage 22. No. of children 1.
History. In labor 5 days: forceps; stillborn; 14 pounds; bladder was emptied; two weeks after delivery the urine began to be lost. Injured about two years.—*Extent of Lesion.* The vagina and uterus destroyed, with the urethra and subpubic tissues; there remained nothing which could be utilized; the loss of tissue unequalled by any other case which had passed under my observation.—*Treatment.* After three months' preparatory treatment to heal the parts, the entrance to the vagina was closed, a small opening being left below; this gave support to the inverted bladder, and was followed by great relief; nothing else could be done.—*Duration of Treatment*, 6 months; *Result*, improved.

137. *Admitted* Oct. 16, 1873. Age 35. Age at marriage 29. No. of children 2.
History. In last labor 48 hours: no other particulars given.—*Extent of Lesion.* A fistula, half an inch in diameter, situated behind and close to the left ramus.—*Treatment.* Closed by two operations.—*Duration of Treatment*, 3 months; *Result*, cured.—*Remarks.* Operated on previous to admission.

138. *Admitted* March 5, 1874. Age 35. Age at marriage 30. No. of children 3; of miscarriages 1.
History. In second labor 26 hours: completed by efforts of nature, stillborn; the bladder was emptied; urine began to escape on the 10th day. Injured about two years; one child since.—*Extent of Lesion.* An opening found at the bottom of a pouch large enough to admit the index finger; the fundus of the bladder prolapsed through this opening; most of the posterior cul-de-sac was also lost with the uterus; the fistula was surrounded by a puckered mass of cicatricial tissue.—*Complications.* There had been great loss of tissue and destruction of the uterus.—*Treatment.* Closed at first with 10 sutures; a portion of the line separated afterwards; closed by another operation with 7 sutures: unsuccessful; third operation, 5 months afterwards, was successful.—*Duration of Treatment*, 6 months; *Result*, cured.

139. *Admitted* March 5, 1874. Age 25. Age at marriage 23. No. of children 1; of miscarriages 1.
History. In labor 26 hours: failed in applying the forceps; delivered by efforts of nature; child weighed 10½ pounds, head very large; urine retained 12 hours before delivery, and had to be drawn for 2 weeks after; urine began to escape at end of 3d week.—*Extent of Lesion.* Loss of the upper third of the anterior wall of the vagina, with the anterior lip of the uterus; the opening contracted so as to be reduced to a size only large enough to admit the finger, and was situated just in front of the cervix; prolapse of the bladder through the opening.—*Treatment.* The remains of the anterior lip formed the upper border of the fistula and made a larger arc than existed below; as a consequence, the angle of the denuded tissue on the vaginal surface had to be carried far out to avoid puckering; 10 sutures used.—*Duration of Treatment*, 5 weeks; *Result*, cured.

140. *Admitted* Sept. 15, 1874. Age 26. Age at marriage 19. No. of children 1.
History. In labor 60 hours: forceps attempted; delivery by craniotomy and blunt hook; child weighed 15 pounds; loss of urine from delivery; had puerperal fever afterwards, with phlegmasia dolens. Injured six years.—*Extent of Lesion.* Loss of the whole anterior wall of the vagina, with partial occlusion of the canal; a large portion of the cervix had also sloughed.—*Treatment.* Had 2 operations to open the vagina, and 3 for closing the fistula.—*Duration of Treatment*, 18 months; *Result*, cured.

141. *Admitted* Oct. 5, 1874. Age 29. Age at marriage 26. No. of children 1.
History. In labor 4 days: no control over the escape of urine after delivery: no further particulars given.—*Extent of Lesion.* Loss of the whole anterior wall of the vagina and part of the anterior lip of the cervix, with the cul-de-sac filled with cicatricial bands.—*Treatment.* The cul-de-sac was freely opened and the cervix divided laterally until it could be drawn down to neck of the bladder: it was then united in this position by 17 sutures; 2 operations afterwards to close small openings.—*Duration of Treatment*, 18 weeks; *Result*, cured.

142. *Admitted* Dec. 17, 1874. Age 35. No. of children 4.
History. In labor 32 hours: delivered by forceps.—*Extent of Lesion.* Anterior laceration of the cervix which had not closed, leaving a fistula in the median line extending half the distance to the neck of the bladder.—*Complications.* Cystitis when admitted.—*Treatment.* Required four months' preparatory treatment: one to free the cervix from cicatricial tissue, and one to close the fistula.—*Duration of Treatment,* 6 months; *Result,* cured.—*Remarks.* Had been operated on twice before admission.

143. *Admitted* Jan. 1, 1875. Age 25. No. of children 2.
History. In labor 98 hours: delivered by forceps; loss of urine since delivery; Injured two years before admission.—*Extent of Lesion.* Half an inch below the cervix was found an opening admitting the finger, the remains of extensive loss of tissue; the cervix and cul-de-sac were destroyed and bands ran in the opposite direction from the anterior edge of the fistula on to the posterior wall of the vagina.—*Treatment.* These bands acting in opposite directions had been the cause of failure; after they had been divided, the fistula was easily closed by 6 sutures. —*Duration of Treatment,* 4 weeks; *Result,* cured.—*Remarks.* Had been operated on three times before admission.

144. *Admitted* Jan. 28, 1875. Age 33. No. of children 2; of miscarriages 1.
History. In last labor 48 hours: breech presentation; no control over the escape of urine from time of delivery.—*Extent of Lesion.* Laceration of the cervix extending into the anterior wall of the vagina, which partially closed, leaving two openings, one at the neck of the bladder, and the other in the median line one inch below the cervix uteri.—*Complications.* Anterior portion of the urethra occluded. —*Treatment.* Each fistula closed by a separate operation.—*Duration of Treatment,* 12 weeks; *Result,* cured.

145. *Admitted* March 9, 1875. Age 30. Age at marriage 26. No. of children 3.
History. In labor 84 hours: twins; forceps; bladder not emptied. Was injured in her first labor.—*Treatment.* 1 operation.—*Duration of Treatment,* 3 weeks; *Result,* improved.—*Remarks.* Had been operated on twice previous to admission.

146. *Admitted* April 21, 1875. Age 25. Age at marriage 22. No. of children 1.
History. In labor 33 hours: no interference; bladder not emptied.—*Extent of Lesion.* A transverse fistula, close to the cervix uteri, about half an inch in length. —*Treatment.* 1 operation; 9 sutures; removed the 10th day.—*Duration of Treatment,* 4 weeks; *Result,* cured.—*Remarks.* Had been operated on three times previous to admission.

147. *Admitted* April 21, 1875. Age 25. Age at marriage 21. No. of children 1.
History. In last labor 15 hours: delivered with forceps.—*Extent of Lesion.* A fistula at the neck of the bladder nearly an inch in diameter, a result of a loss of one-third of the lower portion of the anterior wall.—*Treatment.* 1 operation; 11 sutures; removed on the 12th day.—*Duration of Treatment,* 3 weeks; *Result,* cured.

148. *Admitted* Sept. 18, 1875. Age 25. Age at marriage 20. No. of children 2.
History. First labor, lasting 8 days, terminated by forceps; stillborn; thinks the bladder was emptied; urine began to escape from delivery; in bed 2 months. Injured 4 years; second child born one year after.—*Extent of Lesion.* Fistula at the neck of the bladder, an inch long and half an inch wide, extending from the left of the median line to behind the right ramus; transverse bands from the edges of the fistula ran upon each side of the vagina, more on the left; these caused the anterior lip to somewhat overlap the fistula and to form a sulcus on each side of the opening.—*Complications.* Laceration of the cervix from before backward and on the left side; perineum was extensively lacerated.—*Treatment.* After division of the bands, the fistula became much larger; closed by 13 sutures; kept dry for several days after removing the sutures; second operation to close a new opening, using 6 sutures; again dry for several days, when an opening was found in the first line; this was closed with 7 sutures.—*Duration of Treatment,* 6 months; *Result,* cured.—*Remarks.* Had been operated on once previous to admission.

136. *Adm* [illegible] marriage 32. No. of children 2.
History. [illegible] forceps ; stillborn ; urine lost
two weeks [illegible] *of Lesion.* Laceration through the
Extent [illegible] the posterior lip extended into the
pubic [illegible] cicatricial tissue ; that through the ante-
unequal [illegible] the base to the neck of the bladder ;
ment. [illegible] sides of the fistula backward so as to
the vag [illegible] the cervix ; the tear through the ante-
inverted [illegible] bands were all divided so as to free the
Durat [illegible] in the median line and united with 3
[illegible]—*Duration of Treatment*, 4 weeks ; *Result*,

137. [illegible]
His [illegible]
A fist [illegible] Age at marriage 23. No. of children 10.
Treat [illegible] stillborn ; very large child ; escape of urine
cured. [illegible] months previous to admission.—*Extent of*
[illegible] the bladder, the neck of the bladder, and one-
138. [illegible] terminated along the posterior edge of the fis-
[illegible] wall of the vagina had united to the edge of
H [illegible] cervix and vagina beyond.—*Complications.* Pre-
the [illegible] the fistula ; the perineum had been extensively
two [illegible] small opening a probe passed, demonstrating the
a p [illegible] avoided, the edges of the fistula could be brought
lap [illegible] sutures ; small opening left ; closed by 6 sutures ;
th [illegible] in attempting to introduce the catheter herself ;
—[illegible] *Treatment*, 5 months ; *Result*, cured.

—[illegible]
at [illegible] Age 39. No. of children 4 ; of miscarriages 5.
ra [illegible] had no labor-pains after rupture of the membranes ;
R [illegible] of urine from the time of delivery. Injured five
[illegible]—*Extent of Lesion.* Loss of the base of the bladder,
1 [illegible] bladder and upper part of the urethra ; the opening was
[illegible] from ramus to ramus ; mouth of the right ureter
[illegible] with the cervix projecting into the bladder ; the
[illegible] had become adherent over the posterior lip of the
[illegible] *Complications.* Prolapse of the fundus of the bladder through
[illegible] An attempt had been made to close the fistula and
[illegible] bladder, and this had led to an adhesion of the fundus of
[illegible] this could not now be dissected off, and nothing could be
[illegible] opening ; this was done with 14 sutures.—*Duration*
[illegible] *Result*, cured.—*Remarks.* Had been operated on four times

[illegible] 1875. Age 22. Age at marriage 20. No. of children 1.
[illegible] hours : embryotomy ; bladder not emptied ; loss of urine
[illegible] delivery ; confined to bed five months.—*Complications.* Partial
[illegible] at the depth of an inch, through which can be seen the pro-
[illegible] bladder.—*Treatment.* 2 operations.

[illegible] 1876. Age 25. No. of children 1.
[illegible] 44 hours : forceps ; urine began to escape 3 weeks after
[illegible] *of Lesion.* A fistula but a quarter of an inch in diameter, situ-
[illegible] line and in front of the neck of the bladder ; there had been
[illegible] and the opening was surrounded by cicatricial tissue.—*Treat-*
[illegible] the cicatricial edges were freely removed, and the surfaces
[illegible]—*Duration of Treatment*, 25 days ; *Result*, cured.

[illegible] 4, 1876. Age 46. Age at marriage 22. No. of children 3 ; of
[illegible] 2.
[illegible] Fistula quite small, situated in the median line at the junc-
[illegible] and neck of the bladder.—*Treatment.* 3 operations.—*Duration of*
[illegible] nths ; *Result*, cured.

155. *Admitted* May 19, 1876. Age 35. Age at marriage 27. No. of children 1.

History. In labor 12 hours: delivered with forceps.—*Extent of Lesion*. Loss of the base of the bladder and a portion of the urethra.

156. *Admitted* Oct. 9, 1876. Age 26. Age at marriage 22. No. of children 2.

History. In last labor 48 hours: delivered by forceps. Injured three months previous to admission.—*Extent of Lesion*. Fistula in the neck of the bladder.—*Complications*. Extensive laceration of the perineum.—*Treatment*. 1 operation; 18 sutures; removed 11th day.—*Duration of Treatment*, 14 weeks; *Result*, cured.—*Remarks*. Had been operated on previous to admission.

157. *Admitted* Oct. 17, 1876. Age 36. Age at marriage 17. No. of children 7.

History. In last labor 33 hours: delivered by the efforts of nature; loss of urine since delivery. Injured four years previous to admission.—*Extent of Lesion*. Laceration of the anterior lip of the uterus through the median line, which closed leaving a fistula into the bladder just in front of the cervix.—*Treatment*. 1 operation.—*Duration of Treatment*, 8 weeks; *Result*, cured.

158. *Admitted* Oct. 28, 1876. Age 24. Age at marriage 20. No. of children 1.

History. In labor 20 hours: head impacted 13 hours; embryotomy; bladder not emptied during labor. Injured three years.—*Extent of Lesion*. A fistula quarter of an inch in diameter close behind the left ramus.—*Complications*. Laceration of the perineum.

159. *Admitted* Oct. 2, 1877. Age 47. Age at marriage 32. No. of children 3; of miscarriages 2.

History. With the first child.—*Extent of Lesion*. Fistula quite small, at the neck of the bladder.—*Treatment*. 2 operations.—*Duration of Treatment*, 7 weeks; *Result*, cured.—*Remarks*. Had been operated on several times previous to admission, but the fistula opened by traction.

160. *Admitted* Nov. 19, 1877. Age 30. Age at marriage 28. No. of children 1.

History. In labor 24 hours: delivered with forceps. Injured eight months previous to admission.—*Extent of Lesion*. An opening midway between the neck of the bladder and cervix uteri, an inch in diameter, with a prolapse of the bladder through it.—*Treatment*. 1 operation; 11 sutures; removed on the 11th day.—*Duration of Treatment*, 4 weeks; *Result*, cured.

161. *Admitted* Dec. 17, 1877. Age 27. No. of children 2.

History. In last labor 48 hours: delivered with forceps; loss of urine from the second day after delivery.—*Extent of Lesion*. The cervix had been turned into the bladder, leaving a small and tortuous opening in the midst of cicatricial tissue.—*Remarks*. Had been operated on previous to admission.

RECTO-VAGINAL FISTULA.

162 (LXIX.). *Admitted* Nov. 13, 1862. Age 33. Age at marriage 27. No. of children 1.

History. In labor 140 hours: delivered by forceps; stillborn; no slough was thrown off; feces passed from the vagina three days after delivery.—*Extent of Lesion*. An opening into the rectum was to the left of the median line, half an inch beyond the fourchette, in the shape of a half circle, and scarcely large enough to admit the end of the index finger.—*Treatment*. In consequence of its shape and position, it was closed by dissecting off a flap from the lateral wall, which was folded down over the fistula, so that when secured the vaginal tissue had been turned into the rectum; 9 sutures were used.—*Duration of Treatment*, 4 weeks; *Result*, cured.

163 (LXVI.). *Admitted* Jan. 3, 1864. Age 39. Age at marriage 14. No. of children 8.

History. Eighth pregnancy: 84 hours in labor; delivered by forceps; ergot had been administered without effect, for the head was on the perineum 36 hours;

at the end of 2d week a slough came away, followed by passage of feces from the vagina.—*Extent of Lesion.* A rectal fistula, crescentic in shape with its cornua towards the cul-de-sac, extended from half an inch beyond the fourchette to the cervix uteri; in the centre the edges were about three-quarters of an inch apart, and the opening large enough to introduce two fingers, but there had been evidently a great loss of tissue from the fact that the edges were tense and cicatricial in character.—*Complications.* A vesico-vaginal fistula. See Case 17.—*Treatment.* As the edges were denuded, the surface was increased in width by extending it around on the vaginal surface, and these were brought together by 9 sutures; sutures removed on the 11th day; union perfect; after a few days the parts gradually separated to the original condition; a year after, closed the opening with 8 sutures; bands were freely divided, and the posterior lip split to increase the surfaces; a small opening was left, which was closed afterwards with 4 sutures. —*Duration of Treatment*, 4 months; *Result*, cured.

164. *Admitted* Feb. 2, 1864. Age 26. Age at marriage 24. No. of children 1.
History. In labor 5 days: delivered with forceps.—*Extent of Lesion.* Rectal fistula, nearly an inch in diameter, just beyond the sphincter and in the midst of dense cicatricial tissue.—*Complications.* Vesico-vaginal fistula. See Case 25.—*Treatment.* Closed by 3 operations; from the character of the tissue, the edges would separate after removal of the sutures.—*Duration of Treatment*, not stated; *Result*, cured.

165 (LXVIII.). *Admitted* May 10, 1864. Age 27. Age at marriage 19. No. of children 1.
History. In labor 65 hours: delivered by the efforts of nature; two weeks after delivery sloughs passed, when control over contents of the rectum was lost. —*Extent of Lesion.* An opening situated in the median line, about three-quarters of an inch beyond the fourchette; it was circular in shape, about an inch in diameter at the rectal surface, and with receding edges, which were thin and tense. —*Complications.* A small vesico-vaginal fistula. See Case 26.—*Treatment.* Two parallel incisions were made in the axis of the vagina, through cicatricial tissue, to free its edges; first operation failed on account of the vesical fistula, through which the urine escaped after traction was made on closing the rectal opening.—*Duration of Treatment*, 2 months; *Result*, cured.

166. *Admitted* March 15, 1865. Age 27. Age at marriage 25. No. of children 1.
History. In labor 24 hours: craniotomy.—*Extent of Lesion.* Large transverse fistula; vagina much contracted by cicatricial bands.—*Treatment.* 1 operation.—*Duration of Treatment*, 3 months; *Result*, improved.—*Remarks.* Did not return to have a small opening closed.

167 (LXVII.). *Admitted* March 24, 1865. Age 23. Age at marriage 21. No. of children 1.
History. Time of labor unknown: delivered by craniotomy a year previous to admission.—*Extent of Lesion.* A rectal fistula existed behind a fold of the posterior wall of the vagina, formed by contraction of cicatricial tissue around the outlet; this band could not be divided for the purpose of exposing the rectal opening, as its presence afforded a retentive power to the urethra; the cul-de-sac had been destroyed, and the neck of the uterus lost.—*Complications.* A vesico-vaginal fistula. See Case 46.—*Treatment.* The fistula was closed by one operation, performed almost entirely by the sense of touch, as the opening could not be brought into view; 13 sutures used; for a few days there was an escape of flatus, but this soon ceased when the parts contracted.—*Duration of Treatment*, 3 weeks; *Result*, cured.

168. *Admitted* Dec. 8, 1865. Age 23. Age at marriage 19. No. of children 1.
History. In labor 32 hours: natural.—*Extent of Lesion.* Fistula, half an inch in diameter, situated just beyond the sphincter ani.—*Treatment.* 1 operation; 14 sutures; removed 9th day; no union.—*Duration of Treatment*, 4 weeks; *Result*, not improved.—*Remarks.* Would not submit to a second operation.

169. *Admitted* Nov. 17, 1866. Age 24. Age at marriage 22. No. of children 1.
History. In labor 4 days: delivered with forceps.—*Extent of Lesion.* The original condition was an extensive laceration through the sphincter ani and recto-vaginal septum; this closed below, leaving a fistula above between the rectum and vagina.—*Complications.* A vesico-vaginal fistula. See Case 56.—*Treatment.* The united portion was divided with a pair of scissors, and the whole brought together as if for laceration of the perineum.—*Duration of Treatment,* 3 weeks; *Result,* cured.

170. *Admitted* Oct. 19, 1869. Age 27. Age at marriage 26. No. of children 1.
History. Labor lasted 5 hours, and was natural in every respect: on the day after delivery noticed the escape of flatus by the vagina.—*Extent of Lesion.* The fistula extended obliquely from the sphincter muscle to the left, and was an inch in length.—*Treatment.* Closed by one operation.—*Duration of Treatment,* 3 months; *Result,* cured.

171. *Admitted* Jan. 9, 1872. Age 26. No. of children 1.
History. In labor 24 hours: terminated by efforts of nature; child stillborn.—*Extent of Lesion.* Fistula just beyond the sphincter ani.—*Complications.* A vesico-vaginal fistula. See Case 130.—*Treatment.* 1 operation; 5 sutures; removed on the 8th day.—*Duration of Treatment,* 3 weeks: *Result,* cured.

VESICO-VAGINAL FISTULA.

II.—FROM OTHER CAUSES THAN CHILDBIRTH.

172 (LXX.). *Admitted* Nov. 1864. Age 36. Social relation, married. Age at marriage 18. No. of children 10.
History. In Nov. 1862, was delivered, after a labor of three days; shortly after, an abscess burst into the vagina, followed by an involuntary escape of the urine; nine months previous to admission, she had been delivered of her tenth child.—*Local Condition.* Abscess opening into the bladder; from an opening into the vagina, situated about half an inch behind the neck of the bladder, the urine all escaped; a sound was passed along the sinus until it reached the side of the uterus, when its point passed into the bladder.—*Treatment.* The point of a pair of scissors, following a probe, was introduced into the sinus and its course divided up for some two inches until the opening into the bladder had been reached; the edges of the opening into the bladder were then freshened, the tract of the sinus removed in one strip by scissors, and the whole line closed by 11 interrupted sutures.—*Duration of Treatment,* 4 weeks; *Result,* cured.

173 (LXXI.). *Admitted* May 19, 1866. Age 47. Social relation, single.
History. Two years before began to have incontinence of urine; her physician removed a corroded "horseshoe" pessary, one limb of which had entered the bladder; she had not been examined for five years, and did not know of its existence in the vagina.—*Local Condition.* Opening into the bladder was situated behind the left ramus, at the bottom of the sulcus formed between the lateral wall and the base of the bladder; a No. 12 bougie could be passed through the opening, the edges of which were thin and tense, being formed entirely of cicatricial tissue.—*Treatment.* She had been operated on by her physician, and the failure was due to the character of tissue; it was closed with 9 sutures by doubling down a fold of the lateral wall over on to the base of the bladder, so as to inclose the fistula in a pouch below.—*Duration of Treatment,* 4 weeks; *Result,* cured.—*Remarks.* Had been operated on previous to admission.

174 (LXXII.). *Admitted* Dec. 8, 1866. Age 25. Social relation, single.
History. Some 20 months previous to admission she was accidentally wounded by a ball from a revolver.—*Local Condition.* It was found that the ball had entered the right thigh and passed from the vagina through the bladder into the abdominal cavity and lodged above the crest of the ilium.—*Treatment.* No union after the first and second operations, on account of cicatricial tissue and the occurrence of cystitis; finally, this tissue was freely removed, and the third operation was suc-

[illegible] *Treatment*, 6 months; *Result*, cured.—*Remarks.* Had been [illegible] previous to admission.

[illegible] Oct. 15, 1867. Age 34. Social relation, married. Age at marriage [illegible] children 4.

[illegible] a glass syringe break in the vagina about 5 years previous to [illegible] urine immediately, which was increased by the passage of a [illegible] time afterwards.—*Local Condition.* An oblique fistula, half an inch [illegible] found at the neck of the bladder in the midst of cicatricial tissue; [illegible] of secondary syphilis were detected.—*Treatment.* After careful [illegible] treatment, the fistula was closed with 10 sutures, care having been [illegible] all the cicatricial tissue; the sutures were removed on the 12th [illegible] union had taken place.—*Result*, not improved.—*Remarks.* The [illegible] interfered with the process of healing.

[illegible] Nov. 3, 1868. Age 34. Social relation, married. Age at marriage [illegible] children 4.

[illegible] Fistula caused by syphilitic sloughing.—*Local Condition.* Fistula near [illegible] the bladder:—syphilitic condylomata.—*Treatment.* Was placed [illegible] constitutional treatment, and then the fistula closed by 7 sutures, [illegible] removed on the 8th day.—*Duration of Treatment*, 6 months. *Result*, [illegible] The only case in which union was obtained where the patient [illegible] from syphilis.

[illegible] *admitted* Oct. 16, 1868. Age 19. Social relation, married. Age at marriage [illegible] Sterile.

[illegible] An operation had been attempted for the relief of "vaginismus."—[illegible] A small opening found across the neck of the bladder.—*Treat-* [illegible] operations: one to open the vaginal outlet, and the other to close the fi- [illegible] *Duration of Treatment*, 5 weeks; *Result*, cured.—*Remarks.* Delivered of one [illegible] weighing 9 pounds, Feb. 1872.

[illegible] *admitted* Dec. 13, 1870. Age 22. Social relation, single.

[illegible] Congenital absence of the vagina; an attempt had been made to reach [illegible]—*Local Condition.* The urethra in front of the neck of the bladder had [illegible] and the neck divided, so that the finger entered directly into the [illegible]—*Treatment.* An artificial vagina was made and the fistula closed; the [illegible] afterwards developed.—*Result*, cured.—*Remarks.* See history of this case [illegible] the head of Congenital Absence of the Vagina.

[illegible] *admitted* June 6, 1871. Age 62. Social relation, married. Age at marriage [illegible] No. of children 5.

[illegible] Her last child was 20 years of age; change of life at 47; had been [illegible] until three years previous to admission; without any known cause, she [illegible] to suffer from irritation of the bladder; in the preceding January the [illegible] had been opened, but without relief.—*Local Condition.* An attempt had [illegible] made to open the bladder; a portion of the urethra and the neck of the [illegible] had been laid open; the consequence was that the superabundant tissue [illegible] the neck of the bladder crowded into the opening as a plug and caused great [illegible]; there was no cystitis.—*Treatment.* The tissue projecting through the [illegible] was first removed by a double ligature; after its removal she was allowed to return home for six months, during which time the urine had a free [illegible], the fistula was then closed with 6 sutures; successful; it was supposed that a small fissure had existed at the neck of the bladder, causing the irritation. —*Duration of Treatment*, 2 months; *Result*, cured.

[illegible] *admitted* Sept. 18, 1877. Age 24. Social relation, married. Age at marriage 20.

History. Fistula accidentally made during the operation for atresia vaginæ resulting from childbirth.—*Local Condition.* The vagina was constricted from a [illegible] at the depth of an inch; just above this point the false opening extended [illegible] cervix and entered the bladder.—*Treatment.* Closed by 1 operation, and [illegible] were removed on the 9th day.—*Duration of Treatment*, 3 weeks. *Result*,

181. *Admitted* Sept. 27, 1877. Age 40. Social relation, single.

History. Without known cause, began to suffer from cystitis six years previous to admission; two years after had an opening made in the base of the bladder, with entire relief; but the opening was closed too soon, and the disease returned; an attempt was made to dilate the urethra, which resulted in laceration, with no retentive power afterwards.—*Local Condition.* The urethra was lacerated backward from the outlet for half an inch; with an irritable and contracted bladder; from the thickening and contracting of the base of the bladder, the urethra was drawn backward and was in the same condition as if an opening had been made through the base of the bladder.—*Treatment.* Examination gave evidence of an irritable bladder, but none of kidney disease; an opening was made in the bladder and the urethra lengthened out half an inch; second day after operation, irritation of the bladder came on with microscopic evidence of kidney disease; on the sixth day died from uræmic poisoning.—*Duration of Treatment*, 6 weeks; *Result*, died.—*Remarks.* Uræmic poisoning was hastened by the use of ether; with the existing disease the organs were placed above the secreting point in its elimination.

III.—For the Removal of Stone.

182 (i.). *Admitted* April, 1866. Age 46. Social relation, married. Age at marriage 18. No. of children 15.

History. Eighteen months after closing a vesico-vaginal fistula, resulting from an antero-posterior laceration of the cervix, a stone was removed from the bladder. —*Local Condition.* Large stone in the bladder.—*Treatment.* The stone was removed through an opening made in the base of the bladder; in consequence of the previous loss of tissue and size of the stone, it was first crushed through this opening, the large pieces removed with a scoop, and the bladder washed out; three months afterwards, the opening was closed with 8 sutures.—*Duration of Treatment*, 4 months; *Result*, cured.

183. *Admitted* May 13, 1870. Age 40. Social relation, married.

History. Operated on by Dr. Sims in 1860, by which the neck of the uterus was turned into the bladder; remained well for eight years afterwards, when symptoms of cystitis occurred, and her condition was a miserable one at the time of admission.—*Local Condition.* By means of the endoscope, it was found that the mucous membrane of the bladder was extensively ulcerated; until an anæsthetic was given, it was not known that an encysted stone existed on the left side of the bladder.—*Treatment.* The stone was removed through an opening made in the base of the bladder, and for five months the bladder was kept empty and frequently washed out; the fistula was then closed with 6 sutures.—*Duration of Treatment*, 3 months; *Result*, cured.—*Remarks.* 2 years after the operation there had been no return of the cystitis.

184. *Admitted* Sept. 24, 1872. Social relation, married. No. of children 2.

History. Had had a small fistula behind each ramus closed by different operations.—*Local Condition.* After the last opening had been closed, irritation of the bladder came on, which was thought due to the use of the catheter; after a careful examination, an encysted stone was found.—*Treatment.* Removed through an artificial fistula, and the bladder left empty for three months, when the opening was closed; in the interval she had returned home.—*Duration of Treatment*, 2 months; *Result*, cured.—*Remarks.* An ordinary toilet pin was found to have been the nucleus.

185. *Admitted* Sept. 18, 1873. Age 39. Social relation, married. No. of children 6.

History. A stone had been removed from the bladder nine months before admission.—*Local Condition.* Either as a result of the last labor or from a slough following the removal of the stone, atresia of the vagina existed; the opening was small and involved the neck of the bladder, as well as a portion of the urethra, with a prolapse of the mucous membrane of the bladder.—*Treatment.* 5 operations, extending over a period of two years, for opening the vagina and closing the fistula; when last seen, it was supposed that the partial loss of urine was due to traction of the cicatricial tissue on the urethra, as no opening could be found: she was to return in case the loss continued.—*Result*, improved.—*Remarks*. She never returned to the Hospital, and nothing was known of her after-condition.

186. *Admitted* Oct. 31, 1874. Social relation, married.
History. After the closure of a vesico-vaginal fistula, the patient began to have irritation of the bladder, which increased to such a degree as to render her incapable of following any occupation.—*Local Condition*. No examination could be made until ether had been administered; the sound detected a hard mass projecting into the cavity of the bladder, which was situated in the median line near the cervix.—*Treatment*. With a sound in the bladder as a guide, by means of scissors the mass was cut down upon; it was found that a suture had been cut off close to the twist and left in the tissues; the loop had gradually worked around until the two ends of the wire projected into the bladder; on these points a phosphatic deposit had taken place.—*Result*, cured.

187. *Admitted* March 7, 1876. Age 42. Social relation, married. No. of children 6.
History. In January, 1869, she had a vesico-vaginal fistula closed which had resulted from a laceration of the cervix through the anterior lip; the stone was removed in January, 1873, since which time several attempts had been made to close the fistula and without success.—*Local Condition*. A vesico-vaginal fistula remaining after the removal of stone from the bladder; the edges were cicatricial from the frequent freshening of the surfaces for operation.—*Treatment*. Closed by 2 operations, the first not being entirely successful.—*Duration of Treatment*, 7 weeks; *Result*, cured.—*Remarks*. Had been operated on several times previous to admission.

188. *Admitted* Oct. 19, 1877. Age 43. Social relation, married.
History. A stone had been removed from the bladder about four years previous to admission; several attempts had been made to close the opening.—*Local Condition*. An opening in the base of the bladder remaining after the removal of a stone.—*Treatment*. Closed by one operation.—*Duration of Treatment*, 3 weeks; *Result*, cured.—*Remarks*. Had been operated on previous to admission.

IV.—For the Relief of Cystitis.

189. *Admitted* Nov. 8, 1867. Age 35. Social relation, married. Age at marriage 17. No. of children 1.
History. Three years before admission she had a fall; disease of the bladder afterwards.—*Local Condition*. Uterus retroverted; she had had cellulitis; walls of the bladder were thickened, with all the symptoms of cellulitis.—*Treatment*. After seven months' local treatment, and with but little benefit, an artificial opening was made between the vagina and bladder; it was left open for 18 months; first attempt to close it failed on account of its cicatricial edges; 5 months after, the opening was closed with 7 sutures.—*Duration of Treatment*, 32 months; *Result*, cured.

190. *Admitted* June 10, 1868. Age 27. Social relation, single.
History. Two years before admission patient had received a blow against the abdomen, which was followed by irritation of the bladder; she then took cold which resulted in cystitis.—*Local Condition*. When the bladder was opened it was found lined with a mass of granulations, which bled readily.—*Treatment*. On the 10th day after opening the bladder, cellulitis and local peritonitis came on and she was sick for 3 months; after a year, finding no disease with the endoscope, the fistula was closed, 8 sutures being used; after the bladder had gradually become dilated, there was no further difficulty.—*Duration of Treatment*, 24 months; *Result*, cured.

191 (LXXIV.). *Admitted* June 22, 1868. Age 39. Social relation, married. Age at marriage 21. Sterile.

History. At 17 arrested the menstrual flow by putting her feet in cold water; this led to irritation of the bladder; shortly after marriage took cold; was confined to bed for several months afterwards, and had never after been free from irritation of the bladder; had an abscess which emptied into the bladder; fifteen months previous to admission, sudden incontinence of urine came on.—*Local Condition.* After an attack of cellulitis, an abscess formed and refilled a number of times; while under ether the remains could be felt on the left side, extending between the uterus and the bladder under the broad ligament towards the ovary; the bladder was contracted and the uterus immovable; the opening into the bladder entered the vagina just in front of the uterus.—*Treatment.* As it was found that the bladder was not emptied by this sinus, the condition explained the fact that she had not been entirely relieved after the urine began to escape; it was thought best to enlarge this opening; death from uræmia took place 55 hours after the operation.—*Duration of Treatment*, 55 hours; *Result*, died.—*Remarks.* The immediate cause of death was the use of ether, with advanced disease of the kidney.

192. *Admitted* Oct. 13, 1868. Age 33. Social relation, married. No. of children 1.

History. After her labor, which lasted 75 hours, there remained incontinence of urine; this difficulty had existed two years.—*Local Condition.* The urethra was found patulous enough to admit the end of the index finger, as if it had been lacerated by dilatation; there had been laceration of the perineum, and a cystocele existed.—*Treatment.* As it was thought the loss of urine might be due to dragging on the urethra, the operation for cystocele was done and then the perineum closed, but without benefit; the bladder was then examined by the endoscope, and found extensively ulcerated about its neck; this condition, for a time, received local treatment, which seemed to act as a source of irritation; after two years' treatment by various means, it was at length decided to open the base of the bladder; at the end of two weeks it had healed, and she was discharged, greatly relieved: to wash out the bladder daily and return at the end of six months.—*Result*, improved.—*Remarks.* This woman entirely neglected herself on leaving the Hospital, allowed the opening to close, and finally died of Bright's disease.

193. *Admitted* Oct. 5, 1869. Age 19. Social relation, single.

History. After exposure to cold a year previous to admission, began to suffer om irritation of the bladder.—*Local Condition.* Cystitis; vaginitis; general ealth much impaired.—*Treatment.* After local treatment for a month by means the endoscope and with no benefit, the bladder was opened, with entire lief.

4. *Admitted* March 31, 1871. Age 27. Social relation, married. No. of children 1.

istory. Two years previous to admission had a large vesico-vaginal fistula ed; a few weeks after her discharge she began to suffer from irritation of the lder; she became pregnant and was delivered at the end of a year; the diffi- with the bladder increased, and she returned to the Hospital two years after ure of the fistula.—*Local Condition.* Cystitis, with the bladder much con- ed and its coats thickened.—*Treatment.* As the vagina was much shortened, the great loss of tissue necessitating the bringing together of the cervix and of the bladder, a transverse opening had to be made along the old line of ; the loss of blood was great; the bladder was washed out several times a r nine months, when the opening was closed with 8 sutures.—*Duration of ent*, 12 months; *Result*, cured.

dmitted Oct. 2, 1871. Age 35. Social relation, married. Age at marriage . Sterile.

ry. Began to suffer with irritation of the bladder from the time of mar- hich was due to sexual intercourse.—*Local Condition.* A short vagina beginning of her trouble after marriage, and this source of irritation led tis.—*Treatment.* Shortly after admission the bladder was opened, with lief at first; two weeks after had an attack of cellulitis, from which she ecover for two months, but was then in good condition.—*Result*, cured.

149. *Admitted* Sept. 18, 1875. Age 35. Age at marriage 32. No. of children 2.
History. In labor 48 hours: ergot, chloroform; forceps; stillborn; urine lost from the 2d day. Injured ten months.—*Extent of Lesion.* Laceration through the cervix from before backwards; that through the posterior lip extended into the cul-de-sac and healed, leaving a mass of cicatricial tissue; that through the anterior lip extended in the median line along the base to the neck of the bladder; the bands behind the uterus then drew the sides of the fistula backward so as to form a transverse opening just in front of the cervix; the tear through the anterior lip did not close.—*Treatment.* The bands were all divided so as to free the edges of the fistula, when it was closed in the median line and united with 3 sutures in the cervix and 7 in the fistula.—*Duration of Treatment*, 4 weeks; *Result*, cured.

150. *Admitted* Sept. 23, 1875. Age 44. Age at marriage 23. No. of children 10.
History. In labor 24 hours: ergot; stillborn; very large child; escape of urine from time of delivery. Injured ten months previous to admission.—*Extent of Lesion.* Loss of the whole base of the bladder, the neck of the bladder, and one-third of the urethra; the vagina terminated along the posterior edge of the fistula; it was found that the posterior wall of the vagina had united to the edge of the fistula, thus shutting up the cervix and vagina beyond.—*Complications.* Prolapse of the whole bladder through the fistula; the perineum had been extensively torn.—*Treatment.* Through a small opening a probe passed, demonstrating the septum; when this had been divided, the edges of the fistula could be brought together, which was done with 15 sutures; small opening left; closed by 6 sutures; opening again made by the patient in attempting to introduce the catheter herself; closed by 6 sutures.—*Duration of Treatment*, 5 months; *Result*, cured.

151. *Admitted* Nov. 9, 1875. Age 39. No. of children 4; of miscarriages 5.
History. Time not given; had no labor-pains after rupture of the membranes; ergot; forceps; stillborn; loss of urine from the time of delivery. Injured five years; not pregnant since.—*Extent of Lesion.* Loss of the base of the bladder, including the neck of the bladder and upper part of the urethra; the opening was an inch wide and extended from ramus to ramus; mouth of the right ureter exposed; uterus retroverted, with the cervix projecting into the bladder; the posterior wall of the bladder had become adherent over the posterior lip of the uterus up to the os.—*Complications.* Prolapse of the fundus of the bladder through the fistula.—*Treatment.* An attempt had been made to close the fistula and restore the neck of the bladder, and this had led to an adhesion of the fundus of the bladder to the cervix; this could not now be dissected off, and nothing could be done but close the remaining opening; this was done with 14 sutures.—*Duration of Treatment*, 4 weeks; *Result*, cured.—*Remarks.* Had been operated on four times previous to admission.

152. *Admitted* Dec. 9, 1875. Age 22. Age at marriage 20. No. of children 1.
History. In labor 37 hours: embryotomy; bladder not emptied; loss of urine from the time of delivery; confined to bed five months.—*Complications.* Partial atresia of the vagina at the depth of an inch, through which can be seen the prolapsed fundus of the bladder.—*Treatment.* 2 operations.

153. *Admitted* Jan. 3, 1876. Age 25. No. of children 1.
History. In labor 44 hours: forceps; urine began to escape 3 weeks after delivery.—*Extent of Lesion.* A fistula but a quarter of an inch in diameter, situated in the median line and in front of the neck of the bladder; there had been great loss of tissue, and the opening was surrounded by cicatricial tissue.—*Treatment.* 1 operation; the cicatricial edges were freely removed, and the surfaces united by 7 sutures.—*Duration of Treatment*, 25 days; *Result*, cured.

154. *Admitted* Feb. 4, 1876. Age 46. Age at marriage 22. No. of children 3; of miscarriages 2.
Extent of Lesion. Fistula quite small, situated in the median line at the junction of the base and neck of the bladder.—*Treatment.* 3 operations.—*Duration of Treatment*, 3 months; *Result*, cured.

155. *Admitted* May 19, 1876. Age 35. Age at marriage 27. No. of children 1.
History. In labor 12 hours: delivered with forceps.—*Extent of Lesion*. Loss of the base of the bladder and a portion of the urethra.

156. *Admitted* Oct. 9, 1876. Age 26. Age at marriage 22. No. of children 2.
History. In last labor 48 hours: delivered by forceps. Injured three months previous to admission.—*Extent of Lesion*. Fistula in the neck of the bladder.—*Complications*. Extensive laceration of the perineum.—*Treatment*. 1 operation; 18 sutures; removed 11th day.—*Duration of Treatment*, 14 weeks; *Result*, cured.—*Remarks*. Had been operated on previous to admission.

157. *Admitted* Oct. 17, 1876. Age 36. Age at marriage 17. No. of children 7.
History. In last labor 33 hours: delivered by the efforts of nature; loss of urine since delivery. Injured four years previous to admission.—*Extent of Lesion*. Laceration of the anterior lip of the uterus through the median line, which closed leaving a fistula into the bladder just in front of the cervix.—*Treatment*. 1 operation.—*Duration of Treatment*, 8 weeks; *Result*, cured.

158. *Admitted* Oct. 28, 1876. Age 24. Age at marriage 20. No. of children 1.
History. In labor 20 hours: head impacted 13 hours; embryotomy; bladder not emptied during labor. Injured three years.—*Extent of Lesion*. A fistula quarter of an inch in diameter close behind the left ramus.—*Complications*. Laceration of the perineum.

159. *Admitted* Oct. 2, 1877. Age 47. Age at marriage 32. No. of children 3; of miscarriages 2.
History. With the first child.—*Extent of Lesion*. Fistula quite small, at the neck of the bladder.—*Treatment*. 2 operations.—*Duration of Treatment*, 7 weeks; *Result*, cured.—*Remarks*. Had been operated on several times previous to admission, but the fistula opened by traction.

160. *Admitted* Nov. 19, 1877. Age 30. Age at marriage 28. No. of children 1.
History. In labor 24 hours: delivered with forceps. Injured eight months previous to admission.—*Extent of Lesion*. An opening midway between the neck of the bladder and cervix uteri, an inch in diameter, with a prolapse of the bladder through it.—*Treatment*. 1 operation; 11 sutures; removed on the 11th day.—*Duration of Treatment*, 4 weeks; *Result*, cured.

161. *Admitted* Dec. 17, 1877. Age 27. No. of children 2.
History. In last labor 48 hours: delivered with forceps; loss of urine from the second day after delivery.—*Extent of Lesion*. The cervix had been turned into the bladder, leaving a small and tortuous opening in the midst of cicatricial tissue.—*Remarks*. Had been operated on previous to admission.

RECTO-VAGINAL FISTULA.

162 (LXIX.). *Admitted* Nov. 13, 1862. Age 33. Age at marriage 27. No. of children 1.
History. In labor 140 hours: delivered by forceps; stillborn; no slough was thrown off; fæces passed from the vagina three days after delivery.—*Extent of Lesion*. An opening into the rectum was to the left of the median line, half an inch beyond the fourchette, in the shape of a half circle, and scarcely large enough to admit the end of the index finger.—*Treatment*. In consequence of its shape and position, it was closed by dissecting off a flap from the lateral wall, which was folded down over the fistula, so that when secured the vaginal tissue had been turned into the rectum; 9 sutures were used.—*Duration of Treatment*, 4 weeks; *Result*, cured.

163 (LXVI.). *Admitted* Jan. 3, 1864. Age 39. Age at marriage 14. No. of children 8.
History. Eighth pregnancy: 84 hours in labor; delivered by forceps; ergot had been administered without effect, for the head was on the perineum 36 hours;

at the end of 2d week a slough came away, followed by passage of feces from the vagina.—*Extent of Lesion.* A rectal fistula, crescentic in shape with its cornua towards the cul-de-sac, extended from half an inch beyond the fourchette to the cervix uteri; in the centre the edges were about three-quarters of an inch apart, and the opening large enough to introduce two fingers, but there had been evidently a great loss of tissue from the fact that the edges were tense and cicatricial in character.—*Complications.* A vesico-vaginal fistula. See Case 17.—*Treatment.* As the edges were denuded, the surface was increased in width by extending it around on the vaginal surface, and these were brought together by 9 sutures; sutures removed on the 11th day; union perfect; after a few days the parts gradually separated to the original condition; a year after, closed the opening with 8 sutures; bands were freely divided, and the posterior lip split to increase the surfaces; a small opening was left, which was closed afterwards with 4 sutures. —*Duration of Treatment,* 4 months; *Result,* cured.

164. *Admitted* Feb. 2, 1864. Age 26. Age at marriage 24. No. of children 1.
History. In labor 5 days: delivered with forceps.—*Extent of Lesion.* Rectal fistula, nearly an inch in diameter, just beyond the sphincter and in the midst of dense cicatricial tissue.—*Complications.* Vesico-vaginal fistula. See Case 25.—*Treatment.* Closed by 3 operations; from the character of the tissue, the edges would separate after removal of the sutures.—*Duration of Treatment,* not stated; *Result,* cured.

165 (LXVIII.). *Admitted* May 10, 1864. Age 27. Age at marriage 19. No. of children 1.
History. In labor 65 hours: delivered by the efforts of nature; two weeks after delivery sloughs passed, when control over contents of the rectum was lost. —*Extent of Lesion.* An opening situated in the median line, about three-quarters of an inch beyond the fourchette; it was circular in shape, about an inch in diameter at the rectal surface, and with receding edges, which were thin and tense. —*Complications.* A small vesico-vaginal fistula. See Case 26.—*Treatment.* Two parallel incisions were made in the axis of the vagina, through cicatricial tissue, to free its edges; first operation failed on account of the vesical fistula, through which the urine escaped after traction was made on closing the rectal opening.—*Duration of Treatment,* 2 months; *Result,* cured.

166. *Admitted* March 15, 1865. Age 27. Age at marriage 25. No. of children 1.
History. In labor 24 hours: craniotomy.—*Extent of Lesion.* Large transverse fistula; vagina much contracted by cicatricial bands.—*Treatment.* 1 operation.—*Duration of Treatment,* 3 months; *Result,* improved.—*Remarks.* Did not return to have a small opening closed.

167 (LXVII.). *Admitted* March 24, 1865. Age 23. Age at marriage 21. No. of children 1.
History. Time of labor unknown: delivered by craniotomy a year previous to admission.—*Extent of Lesion.* A rectal fistula existed behind a fold of the posterior wall of the vagina, formed by contraction of cicatricial tissue around the outlet; this band could not be divided for the purpose of exposing the rectal opening, as its presence afforded a retentive power to the urethra; the cul-de-sac had been destroyed, and the neck of the uterus lost.—*Complications.* A vesico-vaginal fistula. See Case 46.—*Treatment.* The fistula was closed by one operation, performed almost entirely by the sense of touch, as the opening could not be brought into view; 13 sutures used; for a few days there was an escape of flatus, but this soon ceased when the parts contracted.—*Duration of Treatment,* 3 weeks; *Result,* cured.

168. *Admitted* Dec. 8, 1865. Age 23. Age at marriage 19. No. of children 1.
History. In labor 32 hours: natural.—*Extent of Lesion.* Fistula, half an inch in diameter, situated just beyond the sphincter ani.—*Treatment.* 1 operation; 14 sutures; removed 9th day; no union.—*Duration of Treatment,* 4 weeks; *Result,* not improved.—*Remarks.* Would not submit to a second operation.

169. *Admitted* Nov. 17, 1866. Age 24. Age at marriage 22. No. of children 1.
History. In labor 4 days: delivered with forceps.—*Extent of Lesion*. The original condition was an extensive laceration through the sphincter ani and recto-vaginal septum; this closed below, leaving a fistula above between the rectum and vagina.—*Complications*. A vesico-vaginal fistula. See Case 56.—*Treatment*. The united portion was divided with a pair of scissors, and the whole brought together as if for laceration of the perineum.—*Duration of Treatment*, 3 weeks; *Result*, cured.

170. *Admitted* Oct. 19, 1869. Age 27. Age at marriage 26. No. of children 1.
History. Labor lasted 5 hours, and was natural in every respect: on the day after delivery noticed the escape of flatus by the vagina.—*Extent of Lesion*. The fistula extended obliquely from the sphincter muscle to the left, and was an inch in length.—*Treatment*. Closed by one operation.—*Duration of Treatment*, 3 months; *Result*, cured.

171. *Admitted* Jan. 9, 1872. Age 26. No. of children 1.
History. In labor 24 hours: terminated by efforts of nature; child stillborn.—*Extent of Lesion*. Fistula just beyond the sphincter ani.—*Complications*. A vesico-vaginal fistula. See Case 130.—*Treatment*. 1 operation; 5 sutures; removed on the 8th day.—*Duration of Treatment*, 3 weeks: *Result*, cured.

VESICO-VAGINAL FISTULA.

II.—FROM OTHER CAUSES THAN CHILDBIRTH.

172 (LXX.). *Admitted* Nov. 1864. Age 36. Social relation, married. Age at marriage 18. No. of children 10.
History. In Nov. 1862, was delivered, after a labor of three days; shortly after, an abscess burst into the vagina, followed by an involuntary escape of the urine; nine months previous to admission, she had been delivered of her tenth child.—*Local Condition*. Abscess opening into the bladder; from an opening into the vagina, situated about half an inch behind the neck of the bladder, the urine all escaped; a sound was passed along the sinus until it reached the side of the uterus, when its point passed into the bladder.—*Treatment*. The point of a pair of scissors, following a probe, was introduced into the sinus and its course divided up for some two inches until the opening into the bladder had been reached; the edges of the opening into the bladder were then freshened, the tract of the sinus removed in one strip by scissors, and the whole line closed by 11 interrupted sutures.—*Duration of Treatment*, 4 weeks; *Result*, cured.

173 (LXXI.). *Admitted* May 19, 1866. Age 47. Social relation, single.
History. Two years before began to have incontinence of urine; her physician removed a corroded "horseshoe" pessary, one limb of which had entered the bladder; she had not been examined for five years, and did not know of its existence in the vagina.—*Local Condition*. Opening into the bladder was situated behind the left ramus, at the bottom of the sulcus formed between the lateral wall and the base of the bladder; a No. 12 bougie could be passed through the opening, the edges of which were thin and tense, being formed entirely of cicatricial tissue.—*Treatment*. She had been operated on by her physician, and the failure was due to the character of tissue; it was closed with 9 sutures by doubling down a fold of the lateral wall over on to the base of the bladder, so as to inclose the fistula in a pouch below.—*Duration of Treatment*, 4 weeks; *Result*, cured.—*Remarks*. Had been operated on previous to admission.

174 (LXXII.). *Admitted* Dec. 8, 1866. Age 25. Social relation, single.
History. Some 20 months previous to admission she was accidentally wounded by a ball from a revolver.—*Local Condition*. It was found that the ball had entered the right thigh and passed from the vagina through the bladder into the abdominal cavity and lodged above the crest of the ilium.—*Treatment*. No union after the first and second operations, on account of cicatricial tissue and the occurrence of cystitis; finally, this tissue was freely removed, and the third operation was suc-

cessful.—*Duration of Treatment*, 6 months; *Result*, cured.—*Remarks*. Had been operated on previous to admission.

175. *Admitted* Oct. 15, 1867. Age 34. Social relation, married. Age at marriage 26. No. of children 4.

History. Had a glass syringe break in the vagina about 5 years previous to admission; loss of urine immediately, which was increased by the passage of a slough a short time afterwards.—*Local Condition*. An oblique fistula, half an inch in length, was found at the neck of the bladder in the midst of cicatricial tissue; all the evidences of secondary syphilis were detected.—*Treatment*. After careful constitutional treatment, the fistula was closed with 10 sutures, care having been taken to remove all the cicatricial tissue; the sutures were removed on the 12th day, and no union had taken place.—*Result*, not improved.—*Remarks*. The syphilitic condition interfered with the process of healing.

176. *Admitted* Nov. 3, 1868. Age 34. Social relation, married. Age at marriage 21. No. of children 4.

History. Fistula caused by syphilitic sloughing.—*Local Condition*. Fistula near the neck of the bladder:—syphilitic condylomata.—*Treatment*. Was placed for 5 months on constitutional treatment, and then the fistula closed by 7 sutures, which were removed on the 8th day.—*Duration of Treatment*, 6 months; *Result*, cured.—*Remarks*. The only case in which union was obtained where the patient had suffered from syphilis.

177. *Admitted* Oct. 16, 1868. Age 19. Social relation, married. Age at marriage 18. Sterile.

History. An operation had been attempted for the relief of "vaginismus."—*Local Condition*. A small opening found across the neck of the bladder.—*Treatment*. 2 operations: one to open the vaginal outlet, and the other to close the fistula.—*Duration of Treatment*, 5 weeks; *Result*, cured.—*Remarks*. Delivered of one child, weighing 9 pounds, Feb. 1872.

178. *Admitted* Dec. 13, 1870. Age 22. Social relation, single.

History. Congenital absence of the vagina; an attempt had been made to reach the uterus.—*Local Condition*. The urethra in front of the neck of the bladder had been entered and the neck divided, so that the finger entered directly into the bladder.—*Treatment*. An artificial vagina was made and the fistula closed; the uterus afterwards developed.—*Result*, cured.—*Remarks*. See history of this case under the head of Congenital Absence of the Vagina.

179. *Admitted* June 6, 1871. Age 62. Social relation, married. Age at marriage 19. No. of children 5.

History. Her last child was 20 years of age; change of life at 47; had been well until three years previous to admission; without any known cause, she began to suffer from irritation of the bladder; in the preceding January the bladder had been opened, but without relief.—*Local Condition*. An attempt had been made to open the bladder; a portion of the urethra and the neck of the bladder had been laid open; the consequence was that the superabundant tissue at the neck of the bladder crowded into the opening as a plug and caused great distress; there was no cystitis.—*Treatment*. The tissue projecting through the opening was first removed by a double ligature; after its removal she was allowed to return home for six months, during which time the urine had a free exit; the fistula was then closed with 6 sutures; successful; it was supposed that a small fissure had existed at the neck of the bladder, causing the irritation. —*Duration of Treatment*, 2 months; *Result*, cured.

180. *Admitted* Sept. 18, 1877. Age 24. Social relation, married. Age at marriage 20.

History. Fistula accidentally made during the operation for atresia vaginæ resulting from childbirth.—*Local Condition*. The vagina was constricted from a slough at the depth of an inch; just above this point the false opening extended to the cervix and entered the bladder.—*Treatment*. Closed by 1 operation, and the sutures were removed on the 9th day.—*Duration of Treatment*, 3 weeks; *Result*, cured.

181. *Admitted* Sept. 27, 1877. Age 40. Social relation, single.

History. Without known cause, began to suffer from cystitis six years previous to admission; two years after had an opening made in the base of the bladder, with entire relief; but the opening was closed too soon, and the disease returned; an attempt was made to dilate the urethra, which resulted in laceration, with no retentive power afterwards.—*Local Condition.* The urethra was lacerated backward from the outlet for half an inch; with an irritable and contracted bladder; from the thickening and contracting of the base of the bladder, the urethra was drawn backward and was in the same condition as if an opening had been made through the base of the bladder.—*Treatment.* Examination gave evidence of an irritable bladder, but none of kidney disease; an opening was made in the bladder and the urethra lengthened out half an inch; second day after operation, irritation of the bladder came on with microscopic evidence of kidney disease; on the sixth day died from uræmic poisoning.—*Duration of Treatment*, 6 weeks; *Result*, died.—*Remarks.* Uræmic poisoning was hastened by the use of ether; with the existing disease the organs were placed above the secreting point in its elimination.

III.—For the Removal of Stone.

182 (I.). *Admitted* April, 1866. Age 46. Social relation, married. Age at marriage 18. No. of children 15.

History. Eighteen months after closing a vesico-vaginal fistula, resulting from an antero-posterior laceration of the cervix, a stone was removed from the bladder. —*Local Condition.* Large stone in the bladder.—*Treatment.* The stone was removed through an opening made in the base of the bladder; in consequence of the previous loss of tissue and size of the stone, it was first crushed through this opening, the large pieces removed with a scoop, and the bladder washed out; three months afterwards, the opening was closed with 8 sutures.—*Duration of Treatment*, 4 months; *Result*, cured.

183. *Admitted* May 13, 1870. Age 40. Social relation, married.

History. Operated on by Dr. Sims in 1860, by which the neck of the uterus was turned into the bladder; remained well for eight years afterwards, when symptoms of cystitis occurred, and her condition was a miserable one at the time of admission.—*Local Condition.* By means of the endoscope, it was found that the mucous membrane of the bladder was extensively ulcerated; until an anæsthetic was given, it was not known that an encysted stone existed on the left side of the bladder.—*Treatment.* The stone was removed through an opening made in the base of the bladder, and for five months the bladder was kept empty and frequently washed out; the fistula was then closed with 6 sutures.—*Duration of Treatment*, 3 months; *Result*, cured.—*Remarks.* 2 years after the operation there had been no return of the cystitis.

184. *Admitted* Sept. 24, 1872. Social relation, married. No. of children 2.

History. Had had a small fistula behind each ramus closed by different operations.—*Local Condition.* After the last opening had been closed, irritation of the bladder came on, which was thought due to the use of the catheter; after a careful examination, an encysted stone was found.—*Treatment.* Removed through an artificial fistula, and the bladder left empty for three months, when the opening was closed; in the interval she had returned home.—*Duration of Treatment*, 2 months; *Result*, cured.—*Remarks.* An ordinary toilet pin was found to have been the nucleus.

185. *Admitted* Sept. 18, 1873. Age 39. Social relation, married. No. of children 6.

History. A stone had been removed from the bladder nine months before admission.—*Local Condition.* Either as a result of the last labor or from a slough following the removal of the stone, atresia of the vagina existed; the opening was small and involved the neck of the bladder, as well as a portion of the urethra, with a prolapse of the mucous membrane of the bladder.—*Treatment.* 5 operations, extending over a period of two years, for opening the vagina and closing the fistula; when last seen, it was supposed that the partial loss of urine was due to traction of the cicatricial tissue on the urethra, as no opening could be found: she was to return in case the loss continued.—*Result*, improved.—*Remarks*. She never returned to the Hospital, and nothing was known of her after-condition.

186. *Admitted* Oct. 31, 1874. Social relation, married.
History. After the closure of a vesico-vaginal fistula, the patient began to have irritation of the bladder, which increased to such a degree as to render her incapable of following any occupation.—*Local Condition*. No examination could be made until ether had been administered; the sound detected a hard mass projecting into the cavity of the bladder, which was situated in the median line near the cervix.—*Treatment*. With a sound in the bladder as a guide, by means of scissors the mass was cut down upon; it was found that a suture had been cut off close to the twist and left in the tissues; the loop had gradually worked around until the two ends of the wire projected into the bladder; on these points a phosphatic deposit had taken place.—*Result*, cured.

187. *Admitted* March 7, 1876. Age 42. Social relation, married. No. of children 6.
History. In January, 1869, she had a vesico-vaginal fistula closed which had resulted from a laceration of the cervix through the anterior lip; the stone was removed in January, 1873, since which time several attempts had been made to close the fistula and without success.—*Local Condition*. A vesico-vaginal fistula remaining after the removal of stone from the bladder; the edges were cicatricial from the frequent freshening of the surfaces for operation.—*Treatment*. Closed by 2 operations, the first not being entirely successful.—*Duration of Treatment*, 7 weeks; *Result*, cured.—*Remarks*. Had been operated on several times previous to admission.

188. *Admitted* Oct. 19, 1877. Age 43. Social relation, married.
History. A stone had been removed from the bladder about four years previous to admission; several attempts had been made to close the opening.—*Local Condition*. An opening in the base of the bladder remaining after the removal of a stone.—*Treatment*. Closed by one operation.—*Duration of Treatment*, 3 weeks; *Result*, cured.—*Remarks*. Had been operated on previous to admission.

IV.—For the Relief of Cystitis.

189. *Admitted* Nov. 8, 1867. Age 35. Social relation, married. Age at marriage 17. No. of children 1.
History. Three years before admission she had a fall; disease of the bladder afterwards.—*Local Condition*. Uterus retroverted; she had had cellulitis; walls of the bladder were thickened, with all the symptoms of cellulitis.—*Treatment*. After seven months' local treatment, and with but little benefit, an artificial opening was made between the vagina and bladder; it was left open for 18 months; first attempt to close it failed on account of its cicatricial edges; 5 months after, the opening was closed with 7 sutures.—*Duration of Treatment*, 32 months; *Result*, cured.

190. *Admitted* June 10, 1868. Age 27. Social relation, single.
History. Two years before admission patient had received a blow against the abdomen, which was followed by irritation of the bladder; she then took cold which resulted in cystitis.—*Local Condition*. When the bladder was opened it was found lined with a mass of granulations, which bled readily.—*Treatment*. On the 10th day after opening the bladder, cellulitis and local peritonitis came on and she was sick for 3 months; after a year, finding no disease with the endoscope, the fistula was closed, 8 sutures being used; after the bladder had gradually become dilated, there was no further difficulty.—*Duration of Treatment*, 24 months; *Result*, cured.

191 (LXXIV.). *Admitted* June 22, 1868. Age 39. Social relation, married. Age at marriage 21. Sterile.

History. At 17 arrested the menstrual flow by putting her feet in cold water; this led to irritation of the bladder; shortly after marriage took cold; was confined to bed for several months afterwards, and had never after been free from irritation of the bladder; had an abscess which emptied into the bladder; fifteen months previous to admission, sudden incontinence of urine came on.—*Local Condition.* After an attack of cellulitis, an abscess formed and refilled a number of times; while under ether the remains could be felt on the left side, extending between the uterus and the bladder under the broad ligament towards the ovary; the bladder was contracted and the uterus immovable; the opening into the bladder entered the vagina just in front of the uterus.—*Treatment.* As it was found that the bladder was not emptied by this sinus, the condition explained the fact that she had not been entirely relieved after the urine began to escape; it was thought best to enlarge this opening; death from uræmia took place 55 hours after the operation.—*Duration of Treatment*, 55 hours; *Result*, died.—*Remarks.* The immediate cause of death was the use of ether, with advanced disease of the kidney.

192. *Admitted* Oct. 13, 1868. Age 33. Social relation, married. No. of children 1.

History. After her labor, which lasted 75 hours, there remained incontinence of urine; this difficulty had existed two years.—*Local Condition.* The urethra was found patulous enough to admit the end of the index finger, as if it had been lacerated by dilatation; there had been laceration of the perineum, and a cystocele existed.—*Treatment.* As it was thought the loss of urine might be due to dragging on the urethra, the operation for cystocele was done and then the perineum closed, but without benefit; the bladder was then examined by the endoscope, and found extensively ulcerated about its neck; this condition, for a time, received local treatment, which seemed to act as a source of irritation; after two years' treatment by various means, it was at length decided to open the base of the bladder; at the end of two weeks it had healed, and she was discharged, greatly relieved: to wash out the bladder daily and return at the end of six months.—*Result*, improved.—*Remarks.* This woman entirely neglected herself on leaving the Hospital, allowed the opening to close, and finally died of Bright's disease.

193. *Admitted* Oct. 5, 1869. Age 19. Social relation, single.

History. After exposure to cold a year previous to admission, began to suffer from irritation of the bladder.—*Local Condition.* Cystitis; vaginitis; general health much impaired.—*Treatment.* After local treatment for a month by means of the endoscope and with no benefit, the bladder was opened, with entire relief.

194. *Admitted* March 31, 1871. Age 27. Social relation, married. No. of children 1.

History. Two years previous to admission had a large vesico-vaginal fistula closed; a few weeks after her discharge she began to suffer from irritation of the bladder; she became pregnant and was delivered at the end of a year; the difficulty with the bladder increased, and she returned to the Hospital two years after closure of the fistula.—*Local Condition.* Cystitis, with the bladder much contracted and its coats thickened.—*Treatment.* As the vagina was much shortened, from the great loss of tissue necessitating the bringing together of the cervix and neck of the bladder, a transverse opening had to be made along the old line of union; the loss of blood was great; the bladder was washed out several times a day for nine months, when the opening was closed with 8 sutures.—*Duration of Treatment*, 12 months; *Result*, cured.

195. *Admitted* Oct. 2, 1871. Age 35. Social relation, married. Age at marriage 16. Sterile.

History. Began to suffer with irritation of the bladder from the time of marriage, which was due to sexual intercourse.—*Local Condition.* A short vagina was the beginning of her trouble after marriage, and this source of irritation led to cystitis.—*Treatment.* Shortly after admission the bladder was opened, with great relief at first; two weeks after had an attack of cellulitis, from which she did not recover for two months, but was then in good condition.—*Result*, cured.

196. *Admitted* Feb. 9, 1872. Age 22. Social relation, single.
History. For six years had suffered from irritation of the bladder, from no known cause.—*Local Condition.* No pus found in the urine; the endoscope showed the existence of an erosion at the neck of the bladder.—*Treatment.* An opening made in the base of the bladder, which closed after a month; opened again, but at the end of six months had not materially improved; the urethra was then laid open from a quarter of an inch of the meatus to the neck of the bladder, without cutting through at this point; the diseased surface was thus exposed, and healed after application of the nitrate of silver and keeping the parts clean; the opening in the urethra was afterwards closed at one operation.—*Duration of Treatment,* 18 months; *Result,* cured.—*Remarks.* Aftewards married, had a child, and remained in good health.

197. *Admitted* Oct. 6, 1873. Age 23. Social relation, single.
History. Suffered a year from irritation of the bladder resulting from exposure to cold.—*Local Condition.* After opening the bladder, a fissure was found in one of the folds at the neck; no disease of the bladder.—*Treatment.* Through the opening in the base of the bladder the fissure was brought into view; this was snipped with a pair of scissors; the surface rapidly healed. The fistula was afterwards closed with 10 sutures.—*Duration of Treatment,* 8 weeks; *Result,* cured.

198. *Admitted* Dec. 12, 1873. Age 45. Social relation, single.
History. Obliged to empty the bladder every ten minutes during the past year, or the urine would escape and continue to flow until the bladder had been evacuated.—*Local Condition.* The urine was found loaded with pus; granulations could be felt with a sound at the fundus and other portions of the bladder.—*Treatment.* After washing out the bladder for a month, without any benefit, an opening was made in the base of the bladder; through the opening applications were made to the granulations, and the bladder was washed out frequently.

199. *Admitted* April 28, 1874. Age 30. Social relation, married.
History. From childhood had suffered from irritation of the bladder.—*Local Condition.* Found the uterus retroverted, which was originally the cause of the cystitis; the urine contained pus, but no casts.—*Treatment.* The uterus was replaced, and then the opening was made into the bladder: an artery was divided at the upper angle which required a stitch, twisted as a suture, to arrest it; improved rapidly after the operation.

200. *Admitted* June 15, 1874. Age 31. Social relation, single.
History. Had been operated on for the relief of cystitis twenty months previous to admission.—*Local Condition.* A fistula was found, an inch and a half long, in the bladder, while the urethra had been laid open for two-thirds of its length.—*Treatment.* The edges were denuded, as in an ordinary fistula, and brought together by 12 sutures; the opening in the urethra was closed at the same time.—*Duration of Treatment,* 3 weeks; *Result,* cured.

201. *Admitted* March 21, 1875. Age 32. Social relation, married. Age at marriage 24. Sterile.
History. The bladder had been opened three years before for the relief of cystitis; three attempts had been made to close it without success.—*Local Condition.* Two small openings remained, the original one having been united in the central portion.—*Treatment.* The septum between the openings was divided, the edges freshened, and brought together with 7 sutures.—*Duration of Treatment,* 3 weeks; *Result,* cured.—*Remarks.* Had been operated on three times in the attempt to close the fistula.

202. *Admitted* Dec. 12, 1875. Age 17. Social relation, single.
History. Two years before, the bladder had been opened for the relief of cystitis.—*Local Condition.* Fistula in the median line large enough to admit the index finger.—*Treatment.* Closed by one operation, using 6 sutures.—*Duration of Treatment,* 6 weeks; *Result,* cured.

CHAPTER XXXIV.

DISEASES OF THE URETHRA.

I ENTER upon a consideration of these diseases with mistrust, for our knowledge of them is yet very limited, on account of the great difficulty met with in making proper inspections. What knowledge we do possess is based on pathological views as little trustworthy as those which were held in reference to uterine diseases a generation ago. It is to be hoped that the time is not far distant when the ingenuity of some one will furnish us with effective means of inspecting the urethra, and thus throw as much light upon the nature and treatment of its diseases, as has been done for those of the uterus by Sims's speculum. This is the more to be desired because it is as rare to find the mucous membrane of the urethra in a perfectly healthy condition as it is that of the throat. At least this is true of those women who have passed under my observation, suffering from some form of uterine disease. The cause of this is yet to be determined. It may be but an indication of a general diseased condition of the mucous membranes throughout the body, the result of impaired nutrition; or it may be that the condition of the urethral mucous membrane is only an effect of the obstructed circulation in the pelvis, a result also of impaired nutrition similar to what obtains in the uterus.

For examining the urethra, Dr. A. Reeves Jackson, of Chicago, Ill., recommends a tapering glass tube,[1] closed at one end, and provided with a flange at the other. It has a fenestra on one side, and resembles in shape the well-known rectal speculum, though much smaller. This instrument is two and a half inches long, and half an inch in outside diameter; several sizes would be found useful. It is claimed that a very thorough inspection of the urethra may be made with this speculum. It greatly facilitates making applications at special points, and is useful for the removal of certain growths; but the field of inspection it offers is very limited.

Dr. Skene, of Brooklyn, has employed a somewhat similarly shaped instrument, which he calls the urethral endoscope, describing it as follows :[1] "The instrument consists, 1st, of a glass tube, precisely like an ordinary test-tube, varying in size according to the purpose for which it is used, and, 2d, of a section of a cylinder made black, and having a mirror set at a rather acute angle at its distal extremity. The glass tube is first introduced into the cylindrical section with the mirror, and then with an ordinary concave forehead mirror, light is thrown in upon the mirror within the tube. The cylindrical section can then be moved forwards or backwards, or turned around, and thus the operator is able to explore the canals or cavities into which it is introduced. The advantages claimed for the instrument are, that being a closed tube, it can be introduced into the bladder without escape of urine; and the operator is not annoyed by the condensation of vapor on the mirror; for the tube protects the mirror, and the entire urethra can be explored with the greatest facility." This instrument is unquestionably a useful one, and a valuable addition, so I should judge from my limited use of it. The eye of the operator has to be educated, as in the use of the male endoscope, to the appearance of the tissues. For we find that the lining membrane of the urethra becomes blanched on the introduction of the cylindrical instrument, from its temporarily obstructing the circulation.

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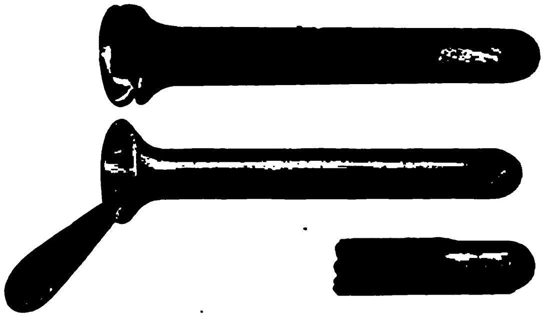
[1] Gynæcological Transactions, vol. ii. 1877.

Fig. 118.



Skene's endoscope.

I have been in the habit of using a diminutive instrument, resembling a Sims's speculum, but made more pointed, the patient being placed for examination on the left side. By drawing the urethra away from under the arch of the pubes, in the same direction in which the perineum is retracted, a fair exposure can be made of the lining membrane near the outlet. I have also used the curette forceps for the same purpose. Both of these instruments give great facility for making local applications, but, like all others yet devised, they enable us to see but little of the parts at the neck of the bladder. The endoscope offers the best means for exploration in this neighborhood, and yet, on account of its limited range, it is far from satisfactory.

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[1] Am. Journ. of Obstetrics, etc., Oct. 1878, p. 768.

In fact with our means for exploration at the present time, I cannot suggest a better procedure than to open the urethra over the point we wish to bring into view. Of course this must not be done carelessly or by an incompetent person. The opening should always be made in the median line, but never extended through the meatus or through the neck of the bladder. It will always prove comparatively an easy matter to close such an opening.

In a general manner the diseases of the urethra may be classified under the following heads:—

1. Inflammation of the mucous membrane, or urethritis.
2. Pedunculated, vascular, and neuromatoid growths.
3. Prolapse of the mucous and submucous tissues.
4. Fissures at the neck of the bladder.
5. Urethrocele.
6. Laceration of the urethra from dilatation.

General inflammation of the mucous membrane, or *urethritis*, may be caused by an extension of gonorrhœal inflammation from the vagina into the urethra, from exposure to cold, or it may result from direct violence. Whenever the lining membrane of the urethra becomes inflamed from any cause, the process must be arrested as soon as possible, or the inflammation may extend to the bladder and lead to more serious difficulties. The patient must be kept in the recumbent position, the bowels acted on by saline purgatives, and the urine made bland by diluent drinks. Hot-water vaginal injections and warm sitz-baths are essential. When it is possible to do so, the urethral tract should be washed out several times a day with warm water. By placing the patient on a bed-pan, a large portion of the urethra can be washed out by simply throwing the water against the outlet, much of which will enter and again escape. If the inflammation is not too great, a pair of long dressing forceps can be introduced, and by separating the blades the canal will be opened quite widely. It is not advisable that the injection should pass into the bladder, since it would be the means of spreading the disease. But if it be evident that the bladder has become involved, it will be necessary to wash out its cavity also. A cone-shaped urethral speculum should be used, made of six wire bars placed at equal distances, and opening out gradually, [illegible] These are small vascular [illegible] exquisitely sensitive, and [illegible] reflex irritation. Therefore, without direct proof to the contrary, I cannot but assume, from the symptoms presenting, that fibres of the sympathetic, accompanying the small vessels in these growths, become involved, and undergo some change. But what the change is, in either nerve fibres or in the bloodvessels which produce these vascular tumors, I am unable to surmise.

For all these growths the treatment is identically the same. They should be drawn up free from the deeper tissues, removed with a pair of scissors having rather dull edges, and after removal the site should be touched with the cautery or nitric acid. The point of a blunt hook heated in a spirit lamp answers the purpose. Or nitric acid may be applied from the end of a wooden match, care being taken to neutralize the action of the acid immediately afterwards by the application of a portion of cotton soaked in a solution of carbonate of soda. Whenever these growths are extensive enough to effect materially the calibre of the meatus, it is better to limit the operation, and watch the effects. It is an error, and one too often committed, to remove at a single operation so much as to narrow seriously the outlet, for this always leads to irritation of the bladder, and to cystitis, whenever the stream of urine is habitually obstructed in its escape.

Prolapse of the Mucous and Submucous Tissues.—This prolapse presents itself at the outlet of the urethra, projecting from the upper or lower portion of the passage, or occupying the entire circumference of the canal. The escape of urine from the bladder becomes necessarily impeded, and,.as the obstruction increases, more or less tenesmus is constantly excited, which in time adds to the difficulty. Ultimately, the whole urethral canal becomes displaced, and pressed forward, or rolled out, by a prolapse of the superabundant tissue about the neck of the bladder.

The urethral canal dilates, necessarily, in proportion to the extent of prolapse, and as the circulation is obstructed the tissues become œdematous. When such a condition remains long without relief, cystitis must be the inevitable consequence, the opium habit follows, and death from disease of the kidneys will be the termination.

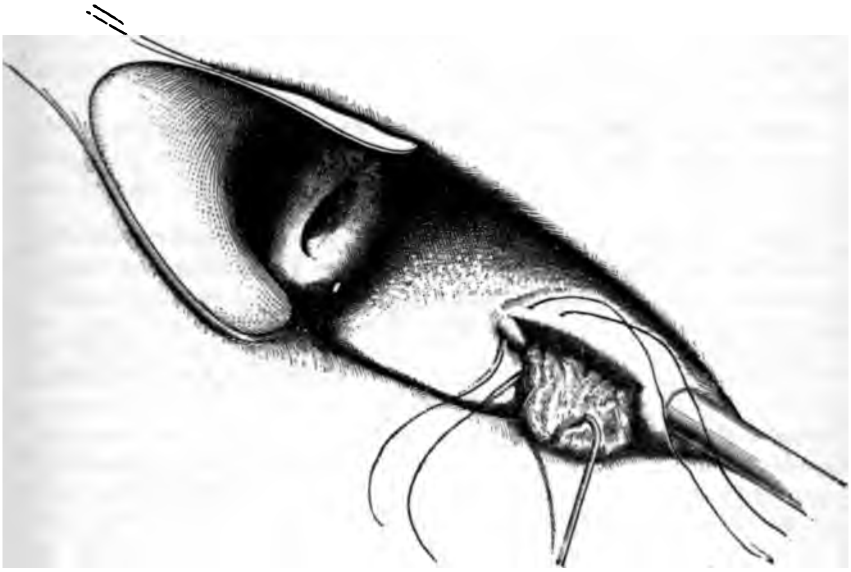
When the prolapse is confined to the upper side, and consists more particularly of the tissues situated at the outlet of the urethra, it may be treated as hemorrhoids are, *i.e.*, tied and cut off. To do this we are to catch up the tissues on a tenaculum, cut around the base, through the mucous tissue, ligate in two sections by a double thread, and cut off the tissue close to the ligature. Care, however, must be exercised to limit the traction to simply lifting the tissues. I have twice had a thrombus to occur as a consequence of inattention to this precaution on the part of my assistant, and in one instance the accident proved to be of a serious character. I operated on a case in the Woman's Hospital, several years ago, in which a thrombus formed from the rupture of a small bloodvessel in the cellular tissue. This dissected off the bladder from the pubes, and extended above the symphysis, and downward through the urethral outlet, dilating it to an enormous size. To prevent extensive sloughing, and to give relief, it was necessary to open the thrombus, and turn out the clot. This was done as far as it could be accomplished, and a large cavity was left which soon became a pus-secreting surface. This gradually filled up by granulation, and the result was a radical cure of the prolapse, but only after much suffering.

When the lining membrane presents at the outlet, as a circular prolapse, it is not good practice to remove it in a mass, as is sometimes done. Only a temporary benefit would result from its removal, and the ultimate consequences would be a most serious and permanent constriction of the outlet of the canal.

Such a case should be treated as for cystitis, by making a vesico-vaginal fistula, with the view to the passage of the urine in another direction, thus obtaining rest for the hypertrophied tissues. After making the fistula, the prolapsed tissues are to be carefully returned, and pushed back into the bladder by a steel sound large enough to fill the canal. The instrument must not, of course, be withdrawn by pulling it directly out, since this would at once reproduce the original condition. It, however, can be removed without causing the prolapse, by rotating it while the fingers make firm pressure upward and backward along the course of the urethra. The tissues are to be returned from time to time in this manner, and made to contract by the application of the strong tincture of iodine. A conical ear speculum affords the best means for making the application to the urethra, and should be introduced as close up to the neck of the bladder as possible. When withdrawn it should be rotated, so as to allow the excess of iodine to follow up toward the outlet, thus rendering the application the more complete. After the tissues are returned the circulation becomes restored and the urethra gradually contracts to its normal size. After the urethra has been restored to its normal condition, the fistula which had been made for its relief may be closed. But before this is done the original cause of the tenesmus should be sought out, and if due to hemorrhoids or fissure in the rectum, or to inflammation in the bladder, or to fissure at its neck, or to any other cause, this must be first relieved to guard against a recurrence of the difficulty.

These cases may be permanently cured by making a button-hole slit in the urethra, through which the loose tissues may be drawn back from the meatus, secured in the edges, the excess cut off, and the opening closed. This operation would resemble the drawing of a portion of a handkerchief through a button-hole in a coat, all being drawn through except the portion grasped by the hand, on the other side. Applying this principle to the urethra, it will be seen that after the slit has been properly made, traction on the tissues should be directed from before backwards. While an assistant is holding up the excess of tissue, a large-sized sound should be introduced so as to smooth out, as it were, the lining membrane, and carry it towards the neck of the bladder, and place the canal somewhat on the stretch. While this instrument is in place, the sutures should be introduced entirely through the flaps into the urethra so as to transfix the lining membrane along the edges of the wound; the excess of tissue is then removed with a pair of scissors, and the opening closed. If this incision be made just in front of the neck of the bladder, it need not be extended towards the outlet of the urethra to a greater extent than will just allow the desired amount of tissue to be drawn through. The lining membrane must become permanently adherent along this line, after which the lax tissue will be confined within the bladder, and no prolapse could take place from beyond.

Fig. 119.



The author's operation for prolapse of the urethral mucous membrane.

For several years I have been on the lookout for a case where the whole lining membrane of the canal prolapsed from the bladder. I felt satisfied that this condition would fully test the value of the operation, which could not be done when the prolapse was only partial.

The following case furnished me the opportunity which I had so long sought.

[illegible] was admitted to my private [illegible] sterile and an invalid [illegible] which time she had suffered [illegible] her, portions of the [illegible] cauterized a number of times [illegible]. She had been [illegible] directed all their efforts [illegible] irritable bladder, while [illegible] standing, and a fissure [illegible] gradually become [illegible] was exceedingly anaemic, and her [illegible]

[illegible] was impressed with the [illegible] cause of the irritation [illegible] marriage; and the [illegible] were the consequence [illegible]

[illegible] weeks the cellulitis improved [illegible] became weaned from [illegible] upon with a marked [illegible] system.

[illegible] the urethra, already [illegible] T. Harrison and [illegible] rolled out upon itself [illegible] this excess of tissue [illegible] nearly into the bladder [illegible] and bled from the [illegible] shows the appearance [illegible] of tissue from the [illegible] slit or button-hole [illegible] been passed to secure [illegible] of the membrane [illegible] excess of tissue had [illegible]

[illegible] the incision was [illegible] made upon a [illegible] the instrument [illegible] through the tissues [illegible] as could be [illegible] entering the urethra. [illegible] was then caught [illegible] a tenaculum, and [illegible] first in one direction and [illegible] the other until the [illegible] tissue was drawn out through the slit without the slightest [illegible]. The sutures were introduced in the manner described, and [illegible] the silver wires were secured by compressed shot.

[illegible] proved an entire success in removing every appear[illegible] relapse, and in relieving the irritation of the bladder.

[illegible] the summer she was able to walk, her general health im[illegible] she gained flesh, and had not the slightest difficulty with the [illegible]

Early in October a fresh attack of cellulitis was brought on from [illegible] and exposure, causing again irritation of the bladder, with a frequent desire to pass the urine.

Nov. 20, 1879, while again an inmate of my private hospital, I made a careful examination of her condition.

The irritation of the bladder, which had been caused by the proximity of the cellulitis on the left side, had already passed away in a great degree, and had in no manner affected the urethra. The canal was found more dilated than natural, but there existed no prolapse of the lining membrane, nor could any portion of it be seen unless by separating the lips. The lining membrane was firmly attached along the line of the incision and could not be drawn out with a tenaculum. It was also evident that this line of attachment prevented indirectly any prolapse from the opposite side of the canal under the arch of the pubes.

When the passage has been permanently dilated, or overstretched, it may be restored to its normal size by placing the suture further back, at the proper distance, and then denuding the edges, including a sufficient portion of the inner surface of the canal. By this means we may reduce the size of the whole canal, or any portion of it.

Fissures at the Neck of the Bladder.—We are so seldom able to determine by ocular proof the presence of fissures at the neck of the bladder, that they often escape notice, and may even be unsuspected. There are no characteristic symptoms, nor any which may not be due to the early stages of cystitis with which this lesion is so closely associated in its causal and semeiological relations. The use of the microscope might determine the fact that the kidneys as well as the bladder were in a healthy condition. By exclusion only may we suspect the existence of a fissure at the neck of the bladder, for all the symptoms might be purely reflex, and due to disease situated elsewhere. I have never been able to detect a fissure by means of the endoscope, although Dr. Skene has been more successful.

My experience holds out to me only one reliable remedy for the class of symptoms under consideration, be the cause what it may. This is rest to muscular tissue, which is to be secured only by opening the bladder and treating the case as for cystitis, which condition, if it does not coexist, must inevitably be produced. The vesico-vaginal septum is to be opened in the manner already described, and as close up to the neck of the bladder as can be done without involving it. While the speculum is still in position, the edges of the incision are to be widely opened by means of a double tenaculum which is to be held afterwards by an assistant. It becomes then possible to detect these fissures by opening the folds around the neck on the bladder surface. This can be done by the aid of the tenaculum, and the examination is greatly facilitated by the use of a laryngeal mirror [illegible] a copper handle that can be bent at any [illegible] angle. Although a few weeks rest and the use of hot water [illegible] is generally sufficient to cause a fissure to heal, it is always [illegible] to expedite the healing process by drawing the edge [illegible] through the angle of the ulcerating line. This may [illegible] bleeding temporarily, but is no disadvantage, as it may be arrested, if too free, by an injection of hot water.

Urethrocele.—But little need be said here as to the treatment of this condition, it has been already referred to under [illegible] the mucous and submucous tissues [illegible] the bladder still exists, or any [illegible]. When we have to treat simply the [illegible] and recognize this as consisting [illegible] canal, or of hypertrophied tissue [illegible] treatment becomes simplified. [illegible] method already given [illegible] same [illegible] hypertrophy of the [illegible] may [illegible] and the whole [illegible] advantageous, the excess [illegible] may be [illegible] when complicated [illegible] will always [illegible] may be properly supported. [illegible] urethrocele.

[illegible] *dilatation.* It [illegible] that [illegible] advantages for examining [illegible] condition of the bladder [illegible] the advantages gained, [illegible] in its diagnostic value [illegible] sometimes follow dila- [illegible] doubt as to its propriety. [illegible] laceration will some- [illegible] are left with perma-

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[illegible] Society, held March 5, [illegible] at the end of the [illegible] that the same in- [illegible] the vagina, or by [illegible] all that is claimed [illegible] incontinence, out of a [illegible] purposes, demonstrates [illegible] injustifiable [illegible] of these cases I after- [illegible] closing an [illegible] that I had made to ascertain the condition of the urethra which had been dilated, and the history will be found already detailed in an earlier part of this work. The other remained for weeks after the accident in the same condition, and was dismissed as incurable. Dr. Noeggerath, who has certainly had more experience in this operation than any one else, had been so fortunate as to produce permanent incontinence in but two out of seventy-five cases, as he stated during the discussion. I am satisfied that with any other operator, less expert, the proportion would have been greater. But accepting this 2.66 per cent. as indicative of the risk which is involved in this operation, I must still hold that the alleged advantages in no degree compensate for it, particularly since an artificial opening in the base of the bladder gives equal facilities for exploration, and is attended with no such risk of incontinence.

The rule is almost without exception, that, in the event of much injury from the overstretching, incontinence of urine follows. The only exception to the rule within my knowledge, was in the case of a young woman who came under the observation of Dr. Paul F. Mundé, where retention followed the dilatation, as a consequence of laceration, so that for six months her bladder could only be relieved by the regular use of the catheter. The doctor placed this case under my care, and as a choice of the lesser evil, I made a permanent opening in the base of the bladder, to avoid the production of cystitis as a consequence of the continued use of the catheter.

I doubted the existence of any local disease after ascertaining the fact that her life at home had been an unhappy one, and calculated to develop the hysterical element, which was a prominent feature in her case, as shown by an hysterical aphonia, which had existed previous to the supposed bladder difficulty.

She had contracted the opium habit and was anæmic from being a confirmed invalid.

After making the fistula and being unable to detect any disease of the bladder, or of the urethra, I became satisfied that the proper course of treatment had been adopted.

At the end of a month the dependence on the use of anodynes, as well as the habits of an invalid, had been broken up, and she was rapidly regaining her general health. She had also nearly recovered her voice, so that only an occasional word would be uttered in a whispering tone. I advised her to visit some friends in the country, and I promised to close the fistula, if she could speak naturally at the end of six months.

A few days after her discharge she came under the care of another physician, impressed with the necessity for the speedy closure of the fistula; and, notwithstanding my object and views in the case were fully presented, the opening was closed. All her old symptoms promptly returned, with a development to a greater degree of the nervous element.

After a short time, and with no improvement in her condition, the urethra was laid open, with a pair of scissors, from the meatus into the bladder.

She has been relieved of all her hysterical symptoms, with the recovery of her voice, and the general health has been restored, as was the case after the fistula was made, but at so serious a cost that the necessity for this special procedure might be questioned.

Incontinence of urine never occurs directly from laceration of the urethra proper, nor is it a consequence always of the injury at the neck of the bladder, since I believe that more or less tearing of the tissues must occur in every instance in which the canal is fully dilated. The urine continues to be lost only when the direction of the cicatricial line interferes with the proper closure of the folds at the neck of the bladder, to which, as has already been stated, the retentive power is wholly due. The whole urethral tract, as far as the neck of the bladder, may be lacerated without necessarily interfering with the retentive power; but if partially lacerated, so far as to increase the diameter and leave the canal patulous, a condition is induced which will, in all probability, lead to inflammatory changes in the bladder by which the tissues of the urethra will be drawn so far back as to prevent the proper falling together of the folds, and the retentive power will be lost. When treating of certain forms of vesico-vaginal fistula I described a like condition. In these cases the rents in the urethral tissue pass through the septum at a right angle to the natural direction of the canal; this then becomes funnel-shaped, with its opening presenting towards and into the bladder. I have seen other instances of laceration, when the canal was left dilated in the anterior portion, and with some contraction about the meatus, but as the neck of the bladder was not injured there was no incontinence. This condition must always lead to cystitis, as a constant irritation is kept up by a small quantity of stale urine being retained within the dilated portion.

I have had, comparatively, little experience in repairing these injuries. In one instance I removed successfully such a pouch by opening the urethra and restoring the canal to its normal size. In another instance, when the neck of the bladder had been permanently drawn back, as I have described, I lengthened the urethra with success. The third case I give somewhat in detail, as it fittingly closes this subject with a description of the pathological changes found in the advanced stages of all the conditions which have been treated of as complicated with cystitis:—

CASE LI.—Jane Morton, aged 40, unmarried, was admitted to the Woman's Hospital, Sept. 27, 1877.

Menstruation had been normal since its first appearance. Without any known cause, cystitis gradually came on about six years previous to her admission. For her relief an artificial vesico-vaginal fistula was made about two years afterwards in Brooklyn. This gave her entire relief, but the opening was closed too soon, and the cystitis returned. The urethra was dilated at the same time, since which she has been unable to retain the urine, and her suffering is greatly increased.

A physical examination disclosed laceration of the urethra, and an irritable and contracted bladder. The uterus and vagina were in a normal condition. Examination of the urine gave evidence of an irritable bladder, but none of any kidney difficulty.

At first attempts were made to aid the retention of urine by maintaining pressure against the symphysis with a soft India-rubber pessary, but without success.

Nov. 6. Made an artificial vesico-vaginal fistula, and closed the laceration through the urethral outlet. From thickening and contraction of the bladder the urethra was drawn backward, and presented the appearance as if a gimlet-hole had been made through the septum just behind the pubes. The laceration was not only closed, but the canal was lengthened in a forward direction fully half an inch.

13*th*. The sutures were removed, and the union found perfect.

Dec. 4. Closed the fistula with fine sutures. This was done, as no evidence of positive disease of the kidneys had been detected, nor of the bladder, except a little at the contracted portion, which might have resulted from the constant escape of urine. I was disappointed, however, to find, after closing the fistula, that the urine escaped from the urethra as before.

7*th*. Violent paroxysms of vomiting came on on the second day after the operation, and the urine became scanty in quantity. Examination of the urine now showed a large amount of pus, an alkaline reaction, and a specific gravity of 1.006. Granular casts from the tubes were found, and columnar epithelium from the pelvis of the kidney.

8*th*. Patient was unable to retain anything on the stomach. The vomiting or retching continued, except when controlled by morphine, and was of that explosive character peculiar to uræmic poisoning. Thus far there had been no cerebral symptoms, and vision continued perfect, and there was no headache. There had been no movement from the bowels since previous to the operation, although injections had been several times administered. During the day the temperature ranged from 99°–101°, and the pulse from 90–110. Towards night the tongue became dry, and the general appearance that of typhoid. At 9 A. M. administered by enema four drops of croton oil in a little glycerine, and by the rectum two ounces each of beef-tea and brandy every three hours, and this was continued throughout the next day, during which the temperature and pulse remained unchanged, and the vomiting continued. During the evening symptoms of cerebral disturbance were noted, and she began to sink. Between 1 and 2 o'clock P. M. she had several copious movements of the bowels, due it was thought to the action of the croton oil. At 4 P. M. it was discovered that there existed a complete suppression of urine; she was gotten into a hot bath without delay, and by 6.30 the skin began to act freely. At 9 A. M. the pulse reached 130, became feeble and intermitting. Gave brandy and wine of digitalis hypodermically, and this was repeated as needed to steady the action of the heart. By 11 o'clock P. M. the pulse had been reduced to 115 per minute, and was held at this rate, by the use of the digitalis, until 5 A. M., *Dec.* 10, when it could be no longer influenced. Coma began at 8 A. M., the vomiting had ceased, and there had been no convulsions; the skin was dry, the pulse feeble and intermitting. She was placed in a vapor-bath several times during the day, but without affecting the condition of the kidneys, and the temperature of the body remained about 101°, with but little variation. The coma became complete at 4 o'clock P. M., and she died within an hour afterwards.

The autopsy was made by Dr. Maxwell, who furnished the following statement of the condition: Jane Morton, examination, Dec. 11, 1877. Body medium stature, fair nourished, rigor marked, no anasarca. Examination of urinary organs only.

Pyo-nephrosis, encapsulated right kidney, occlusion and atrophy of right ureter; dilatation and ureteritis of left. Chronic cystitis, catarrhal and interstitial.—Left kidney. Abnormal adhesions of fatty to fibrous capsule; the latter was moderately attached to the surface of the kidney, but sufficiently so to remove small portions of the cortex on stripping. The kidney measured five inches in length, one inch and a half in thickness, and one inch and three-quarters in width. The surface was lobulated, the summits of the lobules were pale yellow, and the depressed portion reddish in color. On the posterior surface three or four depressions were formed by falling in of the kidney substance. A section showed largely dilated pelvis and calyces, with resulting atrophy from pressure of the parenchyma of the organ. This condition was specially marked at either end, and on the posterior surface. The structure at the upper portion of the kidney was only about two lines in thickness, and at the lower end about three lines. The pelvis and calyces contained a small amount of yellowish-brown puriform liquid of an offensive urinous odor. The walls of the pelvis and calyces were slightly thickened, and the mucous membrane presented evidence of an intense pyelitis, with small patches of pseudo-membrane, mostly found in the dilated calyces. The greater portion of the kidney was markedly atrophied, except two or three pyramids, in the central portion, which still remained of comparatively normal size. Here the pyramids and cortical substance were of pale yellowish color, the columns of tubules were much swollen. The compressed portions showed traces of pyramid and cortex only.

The left ureter was one-half inch in diameter throughout, and partly filled with the same material as found in the pelvis. It contained detached particles of pseudo-membrane from the calyces. The coats were hypertrophied, especially the muscular one, and the mucous membrane presented evidence of chronic ureteritis.

Right kidney. There were firm adhesions of the fatty to the fibrous capsule, and it was impossible to remove the latter. This kidney was four inches long, one inch and three-quarters wide, and one inch and a half thick. It presented a lobulated appearance, and gave on the surface a marked sense of fluctuation, except as to one nodule, on the outer border, which was hard. A section showed the kidney to have been the seat of an encapsulated pyo-nephrosis. The dilated calyces were filled with a semifluid cheesy pus. The solid portion noted was a cretaceous cheesy mass, encapsulated. The pelvis is obliterated, and its site occupied by condensed adipose tissue.

The right ureter was occluded at the commencement, and traced into a cicatricial mass on the pelvis. The whole ureter was atrophied, and its canal impervious, except for a short distance in the upper portion. Its vesical termination was involved in a firm, radiating pigmented cicatrix.

The bladder was contracted, empty, and its capacity less than half an ounce. Its walls were hypertrophied at the base and neck, while the fundus was atrophied. There was evidence of chronic interstitial cystitis, with streaks of connective tissue between muscular bundles. The sutures were still in the edges of the fistula, but no union had taken place. The mucous membrane showed all the evidences of chronic cystitis.

The urethra was nearly one-half inch in diameter. Its mucous membrane was thickened and pigmented. About one-quarter of an inch below the vesical orifice three or four deep pockets of mucous membrane were found, which resembled hernias of the mucous membrane from rupture of the muscular coats, and were evidently the result of laceration attending dilatation of the canal.

Death in this case was undoubtedly hastened by the anæsthetic, which had been used in the absence of any evidence of kidney disease, so far as could be determined by the aid of the microscope. The experience in this case has impressed me with the necessity of using the ophthalmoscope as a diagnostic aid. With this instrument changes in the circulation of the retina can often be detected where the individual has suffered for any length of time from Bright's disease.

In the advanced stages, the microscope cannot be relied on alone, since the secreting portions of the kidney may have been destroyed to such an extent that no greater number of casts would be presented than at an earlier period of the disease. It is always advisable to make a microscopic examination, but before doing so diuretics should be administered for the purpose of increasing temporarily the action of the kidneys. If it be possible to accomplish this, casts and other evidence of disease will be thrown off in larger quantities under this stimulation than would occur from the ordinary action of the organ. Several specimens of urine should be examined in the same order as excreted. If the kidneys are healthy no effects leading to suspicion of disease would be produced by this increased action. In the early stages of nephritis the evidences of disease would be the more likely to lessen under the same influence, while, if the disease were already far advanced, they would be increased.

CHAPTER XXXV.

CYSTITIS. STONE IN THE BLADDER AND URETERS.

THIS disease is so insidious in its course, and has its origin in so many different causes, that it is frequently far advanced before it is recognized. The chief exciting causes are:—

Exposure to cold, resulting either in inflammation of the bladder itself or in the neighborhood; direct violence; neglect in emptying the bladder during parturition; the habit of long retention of the urine; too early closure of a vesico-vaginal fistula, before the tissues have regained a healthy condition; different displacements of the uterus acting as mechanical sources of irritation; fissure in ano and hemorrhoids; some forms of dyspepsia in which the urine becomes irritating; polypi or other growths; and ulceration in the urethra.

There are other causes by which a continued irritability of the bladder may be kept up until what is generally termed chronic cystitis becomes established, but it is unnecessary to enumerate them.

When resulting from exposure or from violence, the whole mucous membrane may become inflamed from the beginning of the attack, constituting a catarrh of the bladder.

But the initial point of irritation is, as a rule, at the neck of the bladder, and the lining membrane of the viscus proper does not become involved until at a comparatively late stage of the disease.

A poor woman may not have had the attention of a physician during a prolonged labor, and her bladder may remain unemptied sometimes for days. The bladder must rise in the abdomen as the accumulation goes on, and a continued traction is thus exerted on the neck of the bladder as it is dragged from under the arch of the pubes. Inflammation is established which does not subside after the bladder has been emptied, but continues to excite a frequent desire to urinate. As a consequence of the straining effort to force out each drop of urine, a crack, or fissure, frequently forms at the bottom of one of the folds of loose tissue about the neck of the bladder.

Whenever the uterus is completely retroverted, the cervix is either left pressing directly against the neck of the bladder, or it is dragged upward and backward. If the uterus is too large and sags in the pelvis, or if the upper portion of the vagina is relaxed, or the perineum lost, so as to no longer furnish support, an irritation will be excited. Whenever the uterus is anteverted and enlarged so as to prolapse, the effect will be the same. It has been shown, in the chapter on displacements, that whenever the uterus reaches a certain point of prolapse its whole weight is suspended from the neck of the bladder. This excites a constant desire to empty the bladder, but as no relief follows, the constant effort in time gives rise to a painful tenesmus.

From whatever exciting cause the difficulty may arise, the bladder long remains a patient sufferer before it becomes seriously diseased. In the beginning a profuse local secretion takes place, especially if the urine be markedly phosphatic, and mucous accumulations follow. At first the urine is to a great extent evacuated, but, in time, the frequent efforts to force out the mucus induce inflammation and thickening at the neck of the bladder, causing a certain amount of stale urine to be retained, and thus increasing the irritation. At length the vesical walls become thickened, the mucous membrane ulcerates, infiltration of urine occurs to some extent, abscesses form, and pelvic cellulitis is not an infrequent sequel. Long ere this the œdematous and thickened tissues have so greatly obstructed the mouth of the ureters that the urine can no longer flow freely into the bladder. The ureters often become enormously distended, the inflammation extends along them to the kidneys, these organs at length become disorganized by the accumulation of urine, and death ultimately results from uræmic poisoning. Before the last stage of the disease has been reached, the poor woman has experienced, through a series of years, an amount of suffering both of body and mind unequalled, I believe, in any other infirmity to which humanity is subject. To alleviate this suffering, these women soon become addicted to the use of opium, and it is almost incredible to what degree of tolerance to this drug they may attain. I have frequently noticed a tendency to a mucous diarrhœa which could be attributed only to the excessive use of opiates; and the resulting frequent desire to evacuate the bowels greatly aggravates the condition of the bladder.

Before considering the proper mode of treatment, let us briefly enumerate the chief anatomical points with which it is important that we should be familiar.

On looking into the bladder from above, it will be noticed that from all directions the parts converge towards a space at the bottom which is near the base of the bladder.

The base proper of the bladder may be represented by a triangle, the mouths of the ureters being situated at each extremity of the base, and the vesico-urethral orifice at the apex. This triangular space maps out the surface where the bladder and vagina are in the closest contact; elsewhere they are more closely connected by cellular tissue. Just outside of the line of the ureters, in the sulcus on each side, run the larger bloodvessels to and from the lower portion of the uterus and neighboring parts. I have made a number of post-mortem examinations of the healthy bladder, both *in situ* and after the removal of the pelvic organs, and in no instance have I found the distance from the mouth of one ureter to the other, or from either to the orifice of the urethra, greater than an inch, the space thus included forming an equilateral triangle. When disease has existed and the bladder has been long contracted, the distance between these points in all probability is somewhat lessened. In a cross section, except at the base, the vagina and bladder occupy to each other about the same relation that two cylindrical bodies would when placed in contact. This anatomical relation must be fully appreciated in its bearing on the mode of operation to be practised for the relief of cystitis.

The female bladder has no sphincter proper, and the retentive power is chiefly due to the loose superabundant tissue about the neck, which falls together in a number of folds. As the urine accumulates the bladder rises in the pelvis and the retentive power is increased by the urethra being drawn up against the arch of the pubes. When the bladder becomes very much distended, these folds all disappear in the dilatation, and the urine dribbles, although the woman may be unable to empty the bladder on account of the traction on the urethra under the pubes. But as the healthy bladder becomes moderately distended and lifted in the pelvis, the lower portion assumes a funnel shape. The action of the abdominal muscles then has the effect of concentrating the pressure on the column of urine urging it into the neck or nozzle, and the cavity is rapidly emptied without notable effort. When inflammation has occurred, this great mobility of the parts is lost, and it requires more of an effort to empty the bladder. The shape of the viscus changes under the influence of disease so as to resemble more that of the male bladder, somewhat of a pouch forming in the posterior portion, thus admitting of the retention of more or less urine which may decompose and add to the difficulty.

Treatment.—As long as the case is one of irritation of the bladder, due to some exciting cause which can be recognized, and the microscope fails to disclose evidence of pus or of casts from the kidneys, we may delay any surgical procedure.

We must first operate on any fissure or hemorrhoids that may exist. If necessary a pessary may be fitted to lift the uterus from the floor of the pelvis, even if in so doing the organ becomes more anteverted, for relief will be obtained when the neck of the bladder is relieved of the weight. At the same time the instrument must be so shaped in front as to make no pressure on the urethra. If the upper portion of the vagina be over-stretched so as to allow of prolapse, relief may be gained from some modification of the operation for procidentia, by which the excess of vaginal tissue is turned in and allowed to retract. With partial or complete cystocele or rectocele, the appropriate operation upon the vaginal wall will be necessary, as well as closure of the perineum.

In the local treatment of the bladder the main dependence rests in the frequent and proper manner of washing out the cavity. This operation the surgeon should perform himself, if possible, using simply warm water in large quantities, to be introduced by means of a siphon syringe placed at a certain height, or injected from a Davidson's syringe with great care, using a double catheter for whichever instrument is employed. After the injection, if the pain has been increased, it will be diminished greatly by a solution of morphine thrown into the bladder. Although the absorbing power of the bladder is very limited in a healthy state, yet in this condition it is sufficient to be sensibly affected by the anodyne. When the injection of water cannot be borne without increasing the irritation of the bladder, or where there had been no marked improvement in the case after a reasonable time, a surgical operation must be resorted to. This consists in making an opening in the vesico-vaginal septum through which the urine may escape into the vagina, as rapidly as it enters the bladder. In this way absolute rest of the organ is secured and the inflammation will subside. The patient should be given the option of submitting to the operation or not, being assured that there is a reasonable hope of success on the one hand, or on the other inevitable death from extension of the disease to the kidneys. Many objections have been made to surgical interference in these cases. The chief danger is in the involvement of the kidneys, and this has been entirely overlooked, the exceptions taken being based on theoretical grounds alone. The advance to be made in the future will render apparent the necessity for an early resort to the operation before permitting a comparatively simple condition to pass beyond the reach of any remedial means yet known to the profession.

In the winter of 1858 I removed, through an artificial opening made in the vesico-vaginal septum, a calculus from the bladder of a patient in the Woman's Hospital.[1] She had been an inmate of the institution several years before with a vesico-vaginal fistula, which was closed previous to her discharge. As the bladder was in a diseased condition, by the advice of Dr. Sims, the artificial opening was left for the greater facility afforded in the treatment for restoring the organ to a healthy state. This idea was a new one to me at that time, and to Dr. Sims, I believe, is due the credit of the mode of treatment for cystitis in the female resulting from stone.

While temporarily in charge of the Woman's Hospital, during the summer of 1861, I performed this operation with the view of securing to the bladder rest from persistent tenesmus, in a long-standing case of cystitis following exposure to cold. I was assisted by Prof. James P. White, of Buffalo, and at a meeting of the New York Obstetrical Society, in December, 1870, when he was present as an invited guest, the doctor stated the fact, and that he happened also to be present at the final closure. The idea at the time was supposed to be original, and that it was the first case of cystitis in the female in which the bladder had been opened for the specific purpose of obtaining rest, and as a distinct procedure in the course of treatment. So clear were my views that to the present day there has been no modification of the plan as carried out in the first case.

Dr. Willard Parker, of this city, presented at the annual meeting of the New York State Medical Society for 1867 a paper on "Cystitis and Rupture of the Bladder treated by Cystotomy," which was published in the Transactions for that year. He states that on Jan. 3, 1846, he performed lithotomy on a male when he was unable to remove the stone, but the cystitis was relieved by the free escape of the urine through the opening. At the end of three months a fresh attack of cystitis came on, the kidneys became involved, and death resulted. This case seems to have been instrumental in drawing his attention to the subject. Nov. 23, 1850, Prof. Parker operated at

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[1] The history of the operation, as given in this chapter, has been taken from a paper, entitled "Chronic Cystitis in the Female and Mode of Treatment," read by me before the State Medical Society, and published in the American Practitioner for Feb. 1872.

Bellevue Hospital on a case of chronic cystitis in the male. He says:[1] "The object in view was to open a channel by which the urine could drain off as fast as secreted, and thus afford rest to the bladder, the first essential indication in the treatment of inflammation." The conception of treatment was perfect, and there has been no later advance made in the pathology. The patient died in a few days, and the autopsy revealed the fact that the kidney had undergone degeneration. Although a favorable result was not attained, it clearly establishes Dr. Parker's claim to priority for this mode of treatment of cystitis in the male.

Previous to the reading of this paper, before the State Society in 1867, I had been ignorant of Dr. Parker's views on this subject, and was unable, until several years after, to obtain a copy of the journal in which the case was printed before I became a practitioner in New York.

In July, 1868, I published my work on Vesico-Vaginal Fistula, containing the histories of several cases of cystitis which had been treated by making an opening for the free escape of urine.

At the meeting of the State Society, Feb. 7, 1871, Dr. Bozeman presented a paper on "Urethrocele, Catarrh, and Ulceration of the Bladder in Females," which was published in the New York Journal of Obstetrics for Feb. 1871.

Dr. Bozeman details the history and successful result of an operation for the relief of cystitis, performed January, 1861, the artificial opening having been closed the following June. The patient was cured, and nine years afterwards there had been no return of the disease. It is stated: "To Prof. Willard Parker is due the suggestion of opening the male bladder for the relief of catarrh, and this encouraged me to extend the practice to the female bladder, as I have described. Dr. Emmet and other American surgeons have since adopted the practice in case of vesical catarrh in the female, and I doubt not with equal success." . . . "Delay in the report of my case of ulceration was due to the suspension of all medical journals in the South during the war," etc. This statement is unfortunately calculated to give the impression that the American surgeons who have practised this mode of treatment since 1861 were indebted to Dr. Bozeman. With all due respect for his claims, this is not correct, for, until his paper was presented, he gave the profession no opportunity of knowing that he had ever operated. He has certainly not done justice to himself in so long withholding his claims, and he can scarcely be ignorant that this operation has been the practice at the Woman's Hospital previous to and from the time of his coming to New York, immediately after the war.

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[1] New York Journal of Medicine, 1851, vol. vi., as reported by Stephen Smith, M.D., [illegible] Surgeon to the Hospital.

In the case upon which I operated in 1861 the opening soon closed, and with its closure no further improvement in the condition of the patient took place. I shortly afterwards made a larger opening through which the urine freely escaped. Ten months later I closed the artificial opening, as the thickened condition of the bladder had then disappeared. I have never seen a case of disease of the bladder so extensive as this was, without the coexistence of kidney trouble. The mucous membrane of the bladder had, to a great extent, been lost, and the walls had become so hypertrophied that the bladder, as a hard mass, could be felt contracted behind the pubes, and was exceedingly tender on pressure. This case had been of many years' standing, and her suffering had made a wreck of both body and mind. She was perfectly cured, and came under observation frequently until about 1869, since which time I have lost sight of her.

Case LII.—During the autumn of 1862, shortly after her arrival in this country, an English woman, suffering from cystitis, was admitted to the Woman's Hospital. She refused to submit to any surgical procedure, and shortly afterwards died in consequence of the diseased condition of the kidneys. (I mention the case because she had been for some time under the care of Sir James Y. Simpson previous to leaving Great Britain, and the chief objection made to me and others against an operation was that so high an authority as Prof. Simpson had never intimated the necessity for such a procedure. The credit of this mode of treatment has been recently claimed for Prof. Simpson by Mr. Lawson Tait. Whether the idea occurred to him after this date, or whether he was really indebted to this country for it, is of little consequence. But the fact is proved by this case that previous to the summer of 1862 he was ignorant of the method, and treated his cases simply by injection into the bladder.)

Case LIII.—About 14 years ago, in my private hospital, I closed the lacerated perineum of a woman, who seemed otherwise in excellent health, and was sent to me, I believe, by Dr. Varick, of Jersey City. Ether was administered, but she never regained entirely her consciousness, and died with well-marked symptoms of uræmic poisoning about 32 hours after the operation. It was found that she had Bright's disease, both kidneys being so involved that the secretion of urine was arrested, and only a drachm or two was found in the bladder.

This case was reported, and in the report I called the attention of the profession to the greater necessity for examining the condition of the kidneys than that of the heart. Since then I have had at least five deaths occur from uræmic poisoning in public and private practice, and these, perhaps, might not have occurred, if my assistants had been able to examine, or had appreciated the importance of examining, the urine before the anæsthetic was given.

I established the rule, when in charge of the Woman's Hospital, that the urine should be examined in every case before an anæsthetic was administered. The result was that in a number of instances unsuspected disease of the kidneys was detected, and the operation was performed with the aid of opium, and without an anæsthetic.

To the effects of the anæsthetic I attribute the chief danger attending the operation in the advanced stages of cystitis, although, on account of the hypersensitive state of the bladder, it is almost indispensable; when the kidneys are barely able to perform their function sufficiently well to preserve life, there is great danger in imposing additional work upon them, and, whenever they fail, death from uræmia must rapidly follow.

It has been denied that the kidneys take an active part in the elimination of ether from the blood, but I am convinced that this view is incorrect. Hours after having performed some prolonged operation I have often detected in my own urine the smell of the ether which had been used. I have had no experience with the use of any other anæsthetic in this condition, but on theoretical grounds would consider the use of the nitrous oxide as the least objectionable, and particularly as the operation is one of so short duration. Unfortunately we cannot judge in any case of long standing as to the actual condition of the kidneys, so that the consequences which may follow must be fully appreciated both by the operator and the patient.

The operation as practised for the relief of cystitis is in itself a simple one, and if resorted to before the disease has advanced so far as to involve the kidneys, is as free from risk as any in minor surgery. Even under the most unfavorable circumstances the risk of the operation is justifiable, for by it life may be prolonged, and a great degree of comfort obtained in allaying the persistent efforts to empty the bladder.

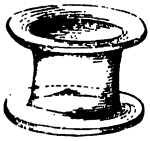
The operation is to be performed under the influence of an anæsthetic when possible, with the patient on the left side, and the anterior wall of the vagina fully exposed by means of a large-sized Sims's speculum. A sound somewhat abruptly curved an inch and a half from its extremity, must be introduced into the bladder and held by an assistant. While the point of this instrument is firmly pressed in the median line against the base of the bladder, a little behind the neck, the projecting tissue on the vaginal surface must be seized with a tenaculum, and divided by a pair of scissors directly on the point of the sound until it can be passed through into the vagina. With the sound remaining in the opening as a guide, one blade of a pair of scissors should be passed into the bladder, and the vesico-vaginal septum be divided backward in the median line. By this mode, especially where the vagina is of a natural size, the operation is extremely simple, and is completed in a few moments. The object in cutting on the point of the sound is to be sure that the bladder and vaginal surface are divided in corresponding incisions, for there is so much mobility of one surface over the other that it is exceedingly difficult to enter the bladder unless the parts are transfixed.

The mode of operating, as described, can be but little improved upon as to simplicity. The median line has been preferred for the location of the incisions, since it is not likely to include any large bloodvessels, unless the opening be extended too near to the cervix uteri, or to the neck of the bladder. In theory, there is no necessity for an opening larger than that equal to the area of the two ureters; in practice, however, is is found that it must be greater at first than this, from the fact, that, in spite of all the care that can be taken to prevent it, a large portion of it will close too soon. Moreover, at first it is a great advantage to have an ample opening through which the accumulated mucus in the bladder may be easily washed out. It is very seldom that much bleeding follows this operation unless, as just stated, the incision is extended too far in either direction. When a large vessel has been divided, it will either be a branch of the circular artery of the cervix uteri, or one given off from the subpubic artery. Bleeding in either direction is readily arrested by introducing a silver suture, so as to include a fair amount of tissue beyond the angle of the wound, and twisting it sufficiently tight. The suture must, of course, be bent flat in accordance with directions given in an earlier part of this book, so that it shall not be an additional source of irritation.

Dr. Bozeman recommends the cutting out of a circular piece, and the plan is a good one, for the opening could then never entirely close of itself. But the size of the piece as recommended by him is too large for any one but an expert to remove. The general operator must bear in recollection the anatomy of the parts, and remove but a moderate sized portion, or he will be apt to include the mouths of both ureters, the neck of the bladder, and to open laterally into the large bloodvessels running along the vagina outside of the bladder.

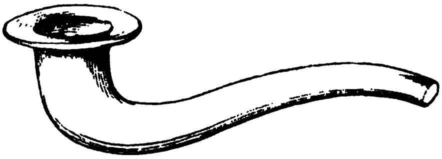
Various means have been resorted to for the purpose of keeping the artificial opening patulous. I have used in some cases with advantage a stud, or eyelet, made from glass tubing half an inch in diameter, and not unlike a spool in shape, which is buttoned into the slit. The portion of the flange to remain within the bladder requires to be but little more than a slight flare, with the edge turned over to keep the instrument in place, while the vaginal rim may be larger to prevent its slipping into the bladder. It will remain loose, and with sufficient play to prevent the parts from healing up too tightly around it. For its removal only a pair of forceps is necessary, by which one side may be turned up for the other to escape. If used it should be made light, and only from the finest quality of Bohemian glass. It is really a most useful device, but I have been obliged to abandon it on account of the difficulty of having it made of a proper quality of glass. If the least amount of lead or any other impurity exists in the glass, it will in a few hours become encrusted with a sabulous deposit from the urine, and will greatly increase the irritation. As a rule, therefore, I think it advisable at first to rely upon the careful introduction of the finger night and morning, but after a few days, when the irritation of the parts has somewhat subsided, the urine is in better condition, and the incision beginning to close, the glass stud may be used with greater advantage. As a substitute for the button, Dr. Bache Emmet, one of the assistant surgeons to the Woman's Hospital, has employed a glass instrument of the shape and size represented in Fig. 121, by which the urine is conducted to the vaginal outlet. It is introduced with less difficulty than the eyelet, and in many cases it answers better, especially where it is advisable to keep the urine out of the vagina and from recently cut surfaces, and it answers well while the patient is remaining quiet in bed.

Fig. 120.



Emmet's cystitis eyelet.

Fig. 121.



Bache Emmet's fistula tube.

Prof. Pallen recommends opening into the bladder with the Paquelin thermo-cautère as follows:[1]—

"The main difficulty hitherto has been to keep the incision open after the use of the scissors or knife. Artificial means must be resorted to, such as an India-rubber tube passed from the urethra through the opening, which is annoying and painful, or a glass button introduced, which is difficult to retain, and when retained is apt to beget vesical tenesmus. I believe the use of the actual cautery at a red heat will be found to answer all purposes." "If the platinum tip of the cautery be heated to a white heat, it cuts through as rapidly as the knife, and, therefore, hemorrhage is to be expected. Besides the thin slough produced by white heat might peel off and union ensue. To avoid both bleeding and contraction, the tip should be raised to a red heat only, and passed slowly along the site of the proposed opening, dividing first the mucous membrane of the vagina, and then held still for a moment or so to allow the adjacent vessels to contract and become occluded. The submucous connective tissue is then burned, and afterwards the bladder wall itself. Extreme delicacy of manipulation is required upon the part of the surgeon, lest he burn directly into the cavity of the bladder, which should be avoided in order to prevent hemorrhage, contraction, and subsequent union."

I have had no experience with this mode of treatment, but feel confident that, without the greatest accuracy of manipulation, serious results might follow. Should the bladder be contracted as it usually is in these cases, the fundus might be in such close proximity to the point of entrance of the cautery as to be also involved. This objection, however, could be overcome by placing the patient on the knees and elbows, and by introducing a catheter into the bladder, so that it may be dilated by atmospheric pressure.

I am inclined to advocate the use of the cautery to the extent of applying it to the raw edges after performing the operation in the usual manner, the edges being rolled out with a tenaculum. To use it might prove a valuable means of keeping the fistula open. Contraction to a great extent would doubtless take place afterwards, but the edges would be in a condition less likely to be irritated by the urine after the slough had been thrown off, than would be the case with surfaces which had just been denuded. I should also anticipate benefit from it as a counter-irritant, unless the cautery were so freely applied as to establish a degree of inflammatory action which could not be limited to the edges of the wound.

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[1] Kolpo-cystotomy, or Artificial Vesico-vaginal Fistula, by Montrose A. Pallen, A.M., M.D., etc. Am. Jour. of Obstetrics, etc., vol. xi. April, 1878.

The usual routine of treatment, in a general way, is to wash the bladder out thoroughly every day by placing the patient on the back with a bed-pan under her hips. Two fingers of the left hand of the operator must press back the perineum while they are inserted into the fistulous opening to separate its edges. Large quantities of warm water must be then carefully thrown into the bladder by means of a Davidson's syringe held in the other hand. The smaller nozzle of the instrument will be the most useful, and may be introduced either through the urethra or directly into the opening. Afterwards the point of a sound must be drawn along the angles of the opening to retard its closure.

The following cases are given in detail, to illustrate some of the difficulties and complications which attend the treatment:—

Case LIV.—Mrs. B., aged 24 years, was admitted to the hospital from Goshen, N. Y., Oct. 17, 1868, with a vesico-vaginal fistula of four months' standing, having followed a labor of 30 hours. There had been an extensive loss of tissue, and after three operations she was discharged cured, March 31, 1869.

A few weeks after her discharge she began to suffer from irritation of the bladder. This increased, and occasionally the urine was mixed with blood. She was pregnant, and was delivered with forceps Feb. 14, 1870. Gradually the difficulty with the bladder became greater, and she was again admitted to the hospital March 31, 1871, suffering fearfully from cystitis. It was with the greatest difficulty and suffering that a double catheter could be introduced for the purpose of washing out the bladder, and this finally became so great that it was necessary to administer an anæsthetic every other day, in order to effect it properly. As but little improvement had taken place on April 21, I made a transverse opening just beyond the neck of the bladder, one inch in length, and somewhat crescentic in shape. This was done in consequence of the great loss of tissue, leaving insufficient room between the cervix and neck of the bladder for an incision in the axis of the vagina. When the finger was passed into the bladder, its walls were found much thickened, the mucous membrane destroyed to a great extent, and coated with the most offensive phosphatic deposit, which when removed caused bleeding from the surface below. Her sufferings were so great, even after the operation, that it was necessary to give her an anæsthetic every other day before washing out the bladder, and often a gallon of warm water was used at a time before the deposit could be removed. A week after the operation I introduced a glass stud in the opening to keep it from closing. The injection was continued daily until August 7, when the glass instrument was removed, as it had begun to excoriate the posterior wall of the vagina. Her general health improved rapidly, and she was free from pain, except during the time the bladder was being syringed out. When the finger was passed within the bladder its surface was felt to have become smooth, but was still tender on pressure; yet the improvement had been very great. The injections were renewed and continued until Oct. 1, half a drachm of carbolic acid being added to each pint of water. This had constituted all the treatment, except that weak solutions of nitrate of silver were applied to all denuded points, in order to prevent the phosphatic deposit. From some unexplained cause a sudden relapse occurred, beginning with a chill and symptoms of pelvic inflammation, and her condition became apparently worse than before the operation. There was fever, and she suffered from pain over the hypogastrium, and the urine became high colored and filled with urates. It was impossible to introduce the finger into the bladder through the opening, the edges of which had long since healed over and ceased to be sensitive. Notwithstanding every care, the whole vaginal surface became denuded of its mucous membrane as a result of the irritating character of the urine, and coated with the phosphatic deposit. The labia inflamed, and became so sensitive that the slightest examination could not be made, except under the influence of an anæsthetic. In a few days the urine was as offensive as if mixed with the contents of an old pelvic abscess. After awhile the vagina could be syringed out several times a day, and the patient was able to take hot sitz-baths. Anodynes, tonics, and other measures were employed to meet indications, and ten drops of dilute nitric acid were given three times a day. As the irritation of the vagina subsided, its excoriated surface and the raw edges of the fistula were touched every other day with a solution of nitrate of silver in spirits of nitric ether, forty grains to the ounce, and after drying the surface collodion was freely applied. She began to improve rapidly, and the free use of the collodion proved of the greatest advantage, not only as protecting the parts from the urine, but also as a local anæsthetic.

November 14, she had gained so rapidly that the finger could be introduced into the bladder without causing pain, and there remained not the slightest vestige of the cystitis. I closed the fistula, using eight sutures, and in denuding removed the surrounding tissues freely, with some doubt as to the success of the operation in consequence of the cicatricial character of the edges which had resulted from the frequent use of the nitrate of silver. She was placed in bed, a small quantity of opium was ordered daily, and a light but nutritious diet. A sigmoid catheter was retained in the bladder, and only removed night and morning for the purpose of cleaning it. Her condition remained comfortable until the sixth day, when a small quantity of urine began to pass by the vagina.

Nov. 22, the sutures were removed, when it was found that a small opening existed near the centre of the line where a suture had cut out, due, it was thought, to traction and the low vitality of the parts. A catheter was retained in the bladder for several days longer, when the quantity of urine lost diminished greatly.

January 20, 1872. This patient continued under observation, and was by this time free from all trouble of the bladder, was in perfect health, and had gained some twenty pounds in weight. The opening was so small a one, that when lying on the back she had retentive power. The bladder was never entirely emptied except through the urethra, so that if the cystitis had not been cured some evidence of it would have remained.

The sound could be passed into the bladder to any point within its cavity, without causing the slightest pain or irritation. In April, 1872, one year after the first operation, the opening was closed, and she remained well afterwards.

CASE LV.—Mrs. O'B., aged 35, was admitted to the Woman's Hospital Nov. 8, 1867. Menstruated for the first time at 16. Married at 17, and gave birth to her only child within a year afterwards. Four months after marriage her husband died.

Her general health from childhood had been delicate. Three years previous to admission she had received a severe fall, and from that time had never been free from irritability of the bladder. This gradually increased, until at length she had constant pain, and was obliged to empty the bladder at least every half hour during the night and day. The urine was sometimes clear, but generally of a dark, fuliginous hue, with often some sediment, and was frequently tinged with blood.

She was found upon examination to be suffering from cystitis of long standing, and to have some thickening of the walls of the bladder. The uterus was retroverted and fixed in position from some previous attack of cellulitis. The organ was normal in size, but the cervix was indurated and small, and the os nearly closed. The microscopic examination indicated that the kidneys were yet in a healthy condition.

An attempt was made to correct the position of the uterus, for the cervix pressed upward against the base of the bladder, and might continue to prove a source of irritation. The finger, in the rectum or vagina, was the only means used to lift up the fundus, for fear of exciting the old pelvic inflammation. This was only partially successful. The cervix was blistered from time to time with acetic solution of cantharides, with the view of lessening the induration, and sponge tents were also carefully used for the same purpose, and to relieve the dysmenorrhœa by opening the os. Her general condition was carefully looked after. With the view to its effect on the bladder, she was placed at one time on a mixture containing ten grains of tannin to each dose. This frequently caused the urine to become acid. When this ceased to have the effect she was placed on a mixture containing benzoic acid, the formula of which was given when treating of vesico-vaginal fistula (see page 626). Large doses of old muriated tincture of iron were used, an old preparation being selected, because, as has been stated, it contains more free acid than the fresh preparations. I believe she at one time readily took a drachm three times a day. An infusion of the triticum repens was also freely given for some time.

March 10, 1868. In consequence of a slight exposure to cold, she suffered from a severe attack of pelvic peritonitis, lost what little benefit had been gained by treatment, and was several months convalescing. At length, after nearly seven months' local treatment in washing out the bladder daily, and having exhausted every local and constitutional resource with but little benefit, an operation was proposed. After fully explaining to the patient the risk of life, in her debilitated condition, should the operation again light up the pelvic inflammation, the products of which had not yet disappeared, she decided to submit in spite of all the dangers, in preference to remaining in her then sad condition.

June 2. The patient was placed under the influence of ether, and with concurrence of Drs. Alfred C. Post, one of the consulting surgeons, and H. P. Farnham, her former physician, the artificial opening was made. The incision was an inch and a half in length, extending from the neck of the bladder nearly to the cervix uteri. The interior of the bladder was found in the usual condition, with the walls thickened and corrugated, but with less ulceration of the mucous membrane; the latter condition being due probably to the length of time she had been under treatment.

July 18. She was discharged, greatly improved both in her local and general condition, to return in the autumn. With the greatest difficulty the fistula had been kept open, and had become so small as scarcely to admit the finger.

October 27. She was readmitted to the hospital, having been under observation during the summer as an out-door patient. Her general health had not improved to any great extent, and she had suffered greatly from the fistula, which had twice nearly closed. The adhesions were broken down so as to admit the finger, and at length it remained permanently open, large enough to admit a No. 6 catheter, through which the urine escaped. During the winter the regular treatment was kept up, with the effect of much improving the cystitis, and the walls of the bladder became softer. Much thickening, however, and induration at the neck of the bladder remained, with tenderness in the urethra, making it unbearable to introduce a catheter into the canal.

June 4, 1869. For several months previous a solution of morphine, containing eight grains to the ounce, had been thrown into the bladder, after washing it out with warm water. As she lay on her back, it was thrown somewhat as a spray through the fistula, so as to wet the upper portion of the bladder, out of reach of the urine, and the excess flowed off below. This plan was followed with great benefit, so that there was decidedly less tenderness on pressure in every portion of the bladder, but she continued to complain whenever a catheter was introduced.

9th. A relapse occurred, apparently without cause, a constant desire to empty the bladder coming on, although the urine all escaped applied as to establish a degree of inflammatory action which could not be limited to the edges of the wound.

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tions so commonly found in the male, and depending on a constitutional condition, are rarely met with among women. It is likely that the uric acid deposit is as frequent with women as with men, but it is washed out before it has time to effect a lodgment. The development of phosphatic calculi, however, is rapid, as the phosphates readily precipitate upon any foreign body that may be present, forming incrustations which are not easily dislodged.

I have seen two instances of stone in the bladder due to spinal injury resulting in loss of motion and sensation.

In 1868 I was consulted in the case of a lady from Norfolk, Va., who was suffering with paralysis of the lower limbs, from a fall. Four months after the fall urine began to escape by the vagina, and in a few days a sufficient number of calculi were passed to fill a large-sized tumbler. I found on examination that the whole base of the bladder had been lost, as well as the urethra and the sub-pubic tissue up to the periosteum; the vagina was almost occluded. The urine had been allowed to accumulate in the bladder after the injury, as she had doubtless lost all sensation in the parts, and the bladder was afterwards never thoroughly emptied. The urine becoming highly phosphatic gave rise to the formation of calculi, which, by the pressure upon the vesico-vaginal septum, produced a slough on account of the impaired vitality of the parts. No attempt was made for her relief, as the paralysis had not yet disappeared, and even had it been possible to close the opening, doubtless sloughing would have again followed in a few weeks. I was never able to learn her subsequent history.

The other patient gradually recovered sensation and motion, and the stone was recognized and removed.

In cystitis calculi frequently form in some pouch where the urine is being retained until it becomes decomposed and phosphatic.

In the greater proportion of the cases which have passed under my observation the calculi have formed within one or two years after a vesico-vaginal fistula had been closed, and generally when the operation had not been performed by myself. The formation has more frequently followed some operation about the neck of the uterus, and generally when laceration had occurred through the anterior lip into the base of the bladder. I have in several instances found the nucleus to be a small portion of wire which had dropped into the bladder as the end of some suture had been clipped. But as a rule I believe the nucleus is furnished by some denuded surface which has been turned into the bladder, or left there through a careless adjusting of the edges of the fistula. Dr. Henry F. Campbell, of Augusta, Ga., has offered a different explanation of the origin of calculi after the operation for vesico-vaginal fistula:[1] "Reasoning, then, from my own case, and from others in which calculi of considerable size have been found to exist in the bladder shortly after closing of fistulæ by operation, I conclude, 1st, that in such cases the stone exists previous to the fistula, perhaps *causing* the slough during the labor in which it occurs; 2d, that, like the present stone, they are grasped by the empty bladder, and remain imbedded during the entire period of the existence of the fistula; and, 3d, that when the fistula had been closed by operation, and the collection of urine in the bladder becomes again possible, the consequent distension releases the stone; the calculus is not, therefore, in process of formation in the bladder at that time, but is only *discovered* after the close of the fistula."

This explanation is original, and I have no doubt is a correct one for a large number of cases. I can recall several instances in my own experience where I was unable to offer to myself any explanation for so rapid a development of stone within a few weeks after closing the fistula. But, on the other hand, I have known of several cases where the loss of tissue had been too great, and too large a portion of the bladder had been constantly inverted for a stone to have had any lodgment. I acknowledge the importance of Dr. Campbell's explanation, and the consequent necessity for passing the finger into the interior of every bladder before closing it. But I am equally certain that an undenuded surface left in the bladder will furnish a starting-point, and a stone may be developed within a short time after closing the fistula.

The symptoms of stone resemble closely those of cystitis, and, unless a steel sound be passed into the bladder, the differentiation will not be easy. This is best done while the patient lies on the back, with her limbs flexed on the abdomen, and held by an assistant on each side. The administration of ether is generally necessary, and it is well to moderately distend the bladder with tepid water before attempting the examination.

There are two methods by which a stone may be removed from the bladder: through the urethra, or through an opening made in the base of the bladder from the vagina. The removal by the urethra is the oldest method. When the stone is soft and of a moderate size, it may be readily crushed by a lithotrite, and, if it be thoroughly broken up, the débris will rapidly pass through the urethra. As a woman, in comparison with a man, is little liable to inflammation, the stone should be repeatedly and thoroughly crushed, and it should all be accomplished at a single sitting. But this should not be undertaken unless the operator has acquired a reasonable amount of dexterity. The chief danger is in wounding or lacerating the lining membrane and neck of the bladder. The first can be avoided, but the second cannot always be guarded against, and is really the chief danger and objection in this mode of operating. The bladder should be filled with water, and on picking up the stone the precaution should always be taken to turn the instrument to one side and then to the other and gently draw it forward, that we may be certain that no portion of the viscus is included within the grasp of the instrument.

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[1] Origin and History of Calculi found in the Bladder, after the Cure of Vesico-Vaginal Fistula by Operation. American Gynecological Transactions, vol. i. 1876.

After the stone has been broken up, it is of the greatest importance to remove the fragments as soon as possible, since the presence of these, it is now well recognized, will usually cause more irritation than is likely to result from any ordinary amount of manipulation. By injecting a quantity of water, through a large-sized double catheter, the débris can generally be washed out; but the procedure is not always satisfactory, and I have preferred to remove the stone entire through an incision from the vagina.

Dr. Henry J. Bigelow,[1] of Boston, has devised an excellent method for crushing a stone in the male bladder, and for removing the fragments, which it appears is even more applicable in the female. His evacuating apparatus consists of an elastic bulb, with a glass tube attached for receiving the fragments of stone. The bulb communicates by means of rubber tubing with the canula, which is introduced into the bladder. It requires some little skill to carry the fenestra of the instrument to the most dependent points, and to keep it free from being stopped up by the walls of the bladder. Two or three ounces of water are injected into the bladder, after it has been evacuated of urine. The bulb is then filled with tepid water, and emptied into the bladder by compressing it slowly. It is next allowed to expand, and the water returns into it from the bladder, bringing with it a greater or less quantity of the crushed fragments, which quickly subside into the glass tube, and are not thrown back into the bladder when the bulb is again compressed. Any larger pieces that remain must in turn be crushed, until all have been broken down to a size which will admit of their passage through the evacuating canula.

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[1] Lithotrity by a Single Operation. Am. Journ. of the Med. Sciences, Phila., Jan. 1878.

Dr. Bigelow's paper is of the utmost practical importance in refuting the long-accepted doctrine that the crushing of stone with safety is a process to be extended over an indefinite period. It is shown by him that this method compares most favorably with the best which have been devised for removing stone.

When the coats of the bladder have become thickened, and marked cystitis exists, the proper course is to extract the stone through an artificial opening in the vesico-vaginal septum.

A stone can by this means be safely removed by one who may not possess the dexterity to crush it properly. It is the operation *par excellence* when the bladder has become so diseased that absolute rest is required, and rest is to be obtained only by allowing the urine to escape as rapidly as it enters the bladder.

I do not know to whom we are indebted for this procedure, but the success attending the closure of vesico-vaginal fistulæ renders it practicable. The operation does not differ essentially from that described for the relief of cystitis by opening the base of the bladder.

After the stone has been removed the patient should be turned on the back, placed over a bed-pan, the nozzle of the syringe introduced through the urethra, and the bladder thoroughly washed out, while the sides of the fistula are kept apart by the index finger introduced into the vagina. After removal of the stone, the opening thus made is closed in the same manner as for vesico-vaginal fistula generally, and it should be closed immediately, unless the mucous membrane is found to be in a diseased condition. In this event, the case must be treated as if it were one of cystitis, and the opening left for the free escape of urine until the parts, by rest, gradually recover their tone.

Removal of Stone from the Ureters.—Calculi are frequently formed in the pelvis of the kidneys, and, while yet small, pass through the ureters into the bladder, there to furnish nuclei for larger accretions, or, happily, to escape by the urethra.

I have met with three instances where the stone had been unable to pass into the bladder, and had remained at the mouth of the ureter, acting as a ball valve. This condition leads to more or less dilatation of the ureter, and causes backache, irritability of the bladder, a sense of weight about the pelvis, and other symptoms, which, unfortunately, are in no wise pathognomonic of the condition. The symptoms all indicate the existence of a stone in the bladder, but become obscure when one is not found. To add to the difficulty, the steel sound will sometimes pass over the stone, furnishing the characteristic sensation, but after a number of careful examinations it may fail to elicit any further information. In two instances I had detected the presence of stone, and had invited several gentlemen to witness me operate for its removal, but, to my mortification, the stone could not be felt again, and the operation was postponed. In one of these cases I afterwards opened the bladder, seeking for a solution of the mystery, and detected with my finger the stone in the mouth of the ureter. I then passed the instrument, which has been described as the curette forceps, alongside of my finger into the ureter, and withdrew the stone with comparatively little difficulty.

In a subsequent case having always felt the click of the steel sound at the same point, I was led to suspect that the stone was in the ureter, and by making slight backward pressure with a large sound in the bladder, I was able to feel it with my finger either in the vagina or rectum.

As the patient lay on the side, with a speculum introduced, I cut down on the stone with a pair of scissors, while an assistant kept the parts prominent by pressing backward and upward with a sound in the bladder.

As soon as I reached the stone, I enlarged the opening forward, towards the neck of the bladder, this being the only safe direction to avoid entering the peritoneal cavity. After considerable difficulty I succeeded in getting hold of the stone, and in withdrawing it, without having entered the bladder or peritoneal cavity.

This stone is in the collection of Dr. Edward L. Keyes of this city, who has furnished me with the following description. "The general shape and size is like a portion of the little finger, the surface being smoothly bossed. Its long diameter measured 1⅞ inch, after a small portion had been broken off and lost; the short diameter ½ inch. The greatest circumference 4⅜ inches; the lesser one 1½ inch. The weight was 98 grains, twelve years after its removal. Its composition was mainly carbonate, with some phosphate of lime, a trace of amorphous urate, and a little organic matter."

I closed the opening with interrupted sutures, and was particularly careful to see that their points of exit and entrance were along the external surface of the ureter, so that the line approximated with the greatest accuracy. The case made a good recovery.

CHAPTER XXXVI.

DISEASES OF THE OVARIES.

Oöphoritis—Enlargement—Treatment—Battey's operation.

PRIMARY interstitial inflammation, or (according to Kiwisch[1]) inflammation of the ovarian stroma, occurs very seldom in the non-puerperal state, especially if we exclude slight œdemas and hyperæmias, which are frequently developed in the pelvic organs during menstrual congestions, and other determinations of blood.

Schrœder[2] states: "Two forms of oöphoritis are to be distinguished: the parenchymatous, or follicular, in which the structures proper of the gland, the Graafian follicles, are inflamed, and the interstitial, in which the connective tissue stroma is inflamed. Inflammation of the glandular part of the Graafian follicles is, according to the investigations of Slavjansky, very frequent." Scanzoni and others designate a third form due to "inflammation of the peritoneal covering of the ovary," but as recent observers have been able to demonstrate the fact that the ovary is not covered by the peritoneum, this form cannot be accepted without further explanation. The surface of the ovary undoubtedly becomes inflamed, but this is due to its close connection with the peritoneum, so that any inflammation of this membrane in the neighborhood of the ovary must involve that organ. This is so common that we believe the ovaries suffer far more from peritonitis or cellulitis in their vicinity than from disease originating within, or confined to their own structure.

Scanzoni[3] met with only a single case of non-puerperal acute ovaritis, where, in consequence of death from pneumonia, he was unable to study the exact pathological changes. After describing the post-mortem condition he says: "The pathological alterations which we have met with in this ovary correspond perfectly to the description which some authors have given of acute ovaritis; considerable increase in the size of the organ, notable hyperæmia, traces of effusion in the vesicles, purulent foci in the parenchyma, and fibrinous exudation under the peritoneal envelope of the organ. After what precedes, it may be seen that in this case we had a combination of the three forms of ovaritis, which confirms our assertion on the subject of the rarity of its existence in an isolated form."

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[1] Diseases of the Ovaries, etc., translated by John Clay, London, MDCCCLX. p. 65.

[2] Ziemssen's Cyclopædia of the Practice of Medicine, vol. x. N. Y. 1875, p. 351.

[3] N. Y. edition, p. 396.

As rare as ovaritis is in the non-puerperal state, the opportunity is afforded still less seldom to study its post-mortem appearances. When the whole ovary becomes enveloped in a mass of lymph, as in this case, the vesicles themselves must become inflamed, since they are unable to discharge their contents. We have here, doubtless, a clue to the cause of many cases of sterility, because such a condition must prevent the escape of the ova from the Graafian vesicles, and induce atrophy of the ovary. The severe character of the pain so commonly experienced may be due to pressure, as in the case of hematocele, where the limited space, which has been completely closed in by the inflammatory process, becomes distended by continued effusion of blood.

The ovaries are supplied with nerves from the renal plexus, but so scantily that in the absence of inflammation, a doubt may arise as to the pain which is so frequently experienced in their neighborhood being due to "ovarian irritation," or whether even it has any direct connection with the ovaries. A woman seldom suffers from "ovarian neuralgia" without at the same time giving evidence of uterine disease, but it is not always easy to place these two phenomena in their proper relation of cause and effect. We may often be able to attribute the diseased condition in both organs to a common cause, extrinsic to both. Any obstruction to the circulation in the pelvic connective tissue, if due to nothing more than a general lack of tone, tends to increase the venous circulation both in the ovaries and uterus. The remains of an old cellulitis have the same effect, and may so obstruct the circulation as to establish an erosion on the cervix, the result of nature's efforts to relieve the congestion by an increase of secretion.

Much damage is done at times by inflammation due to childbirth, the subsequent contraction and pressure producing disturbance of the nervous system, and of menstruation, and even sterility. But we possess no positive means of recognizing these pathological changes during life, or, if recognizing them, to remedy the difficulty. It is of no practical value to make a distinction as to any special form of oöphoritis, and the fact already stated may be remembered, that the ovary itself is seldom the seat of inflammation, except as a result of childbirth.

Inflammation of the ovary, however, sometimes occurs after surgical operations on the uterus, or after a sudden suppression of the menstrual flow. But it is usually coincident with cellulitis and peritonitis, and presents no distinct symptoms to indicate its existence. As a rule, the symptoms of a severe peritonitis will so mask every other condition, that the extent of injury to the ovary is only to be estimated later after the subsidence of the peritonitis. It may only have become "scorched" in the general conflagration, and its function may be afterwards restored by a reparative process, that is, so far as relates to the proper performance of ovulation; but should adhesions form, sterility would, in all probability, result from the ovum being obstructed in its passage to the uterine cavity.

But whatever may be the exciting cause of the oöphoritis, its course varies but little. If the inflammation has extended to the deeper tissues, and recovery does not take place by resolution, the follicles become involved one after the other, but by so slow a progress that the condition may be termed a chronic inflammation, and recurrent attacks of local peritonitis are frequent. At length the inflammation brings about contraction of the follicles, and, bands forming on the surface, a condition of atrophy is produced, compared by different writers to cirrhosis of the liver.

Abscesses sometimes form in the ovary, but, as a rule, the local condition is practically a pelvic cellulitis, or peritonitis, as far as concerns the symptoms, progress, and termination. The escape of the pus takes place through the pelvic cellular tissue and peritoneum, most frequently into the peritoneal cavity, or into the intestines; but it may pass into the rectum, vagina, bladder, or along the course of the psoas muscles. An abscess in the ovary would present the same general symptoms as a pelvic abscess, but a digital examination per rectum would disclose the altered shape of the ovary, and a greater mobility of the mass than is ever presented in cellulitis. With an ovarian abscess the life of a woman is certainly in greater jeopardy than it would be in inflammation of the cellular tissue of the pelvis, since the probability is much greater that rupture would occur into the peritoneal cavity before adhesions had taken place.

Kiwisch, p. 94, states: "Thus we have seen patients who have carried abscesses of considerable size in the pelvis for years, and who have attended, in comparative health, to their domestic duties." I have seen but one instance of this kind.

Case LVII.—Feb. 13, 1872, Mrs. D., aged 48, came under my care, after a consultation with Dr. Noyes, who had been treating her for eye trouble, and had suspected a possible reflex irritation from some uterine disease. She gave the following history: Menstruation appeared for the first time at 15; she became regular at once, the flow lasting a week without pain, and she was in excellent health when married at 20 years of age. She gave birth to six children, at full term, by natural labor, and had miscarried twice. The last child was then eight years old, and the last pregnancy terminated in miscarriage, at four months, about five years previous to consulting me. She stated that it had been necessary to employ instruments to remove the fœtus, and she suffered from hemorrhage. She had a long convalescence, and never afterwards entirely regained her previous good health. Menstruation after this miscarriage became more free, lasting from ten to twelve days, frequently amounting in quantity to a hemorrhage, and often returning in the intervals between the periods. She had gradually become weaker, and unable to exercise or stand for any length of time without aggravating a pain on the left side, from which she was seldom free.

The uterus was four inches deep, and anteverted. A number of granulations in the uterine canal could be felt with the probe, and on withdrawing the instrument the discharge of blood was quite free. An unusually deep fissure existed through the posterior lip, which had extended partially into the bottom of Douglas's cul-de-sac, and healed, but yet remained patulous enough to allow a finger to be introduced nearly to the internal os. A mass, about the size of a large hen's egg, was felt on the left side. This could not be well defined from the vagina, but as felt from the rectum it was found to be uniform in shape, and was supposed to have been the remains of an old cellulitis involving the ovary. She was very anæmic, and a functional murmur was audible over the region of the heart, and the vessels of the neck.

Feb. 16. She entered my private hospital, flowing very freely. She was kept in bed, and an application of impure carbolic acid was made to the fundus daily by means of the applicator, followed by a vaginal tampon. By Feb. 21st the hemorrhage was arrested.

23*d*. A sponge tent was introduced, which dilated the canal fully, and, after removing a large quantity of granulations with the proper forceps, I applied equal parts of carbolic acid and glycerine freely throughout the canal. This had the effect of arresting the flow of blood for a month. At the end of that time, however, there came on a watery discharge, which it was thought advisable to stop, if possible, on account of the extremely anæmic condition of the patient.

March 25. The canal was again partially dilated, to facilitate the application of the carbolic acid. She had no further local treatment, and suffered no inconvenience afterwards, and there was a decided improvement in both her appearance and strength. This was her condition on retiring to bed.

30*th*. The weather was mild, and the temperature of her room during the night was too warm, so that she was quite restless. While half awake she suddenly turned in bed, when she felt "something move inside of her." She became nauseated, and vomited; the prostration was so marked that I was called up to see her, and found her in collapse. In a few hours she reacted; a violent chill then occurred, followed by fever, and her pulse increased to 130 per minute. During the day her fever continued, but she was relieved of pain in the abdomen by the use of opium and hot applications.

April 1. During the forenoon she had another chill, but it was not as violent as the previous one. At 3 P.M., her pulse being 120, the skin began to be moist, and she exhibited other indications of blood poisoning. Ten grains of quinine were given at 9 P.M.; this dose was repeated at 12 P.M., her pulse having then fallen to 110; the same quantity was administered at 3 A.M.

2d, 9 A.M. The quinine was not given, as the stomach was irritable. The pulse had fallen to 106, but, as its character was indicative of a loss of power, she was ordered iced champagne. Dr. T. G. Thomas saw the case in consultation at half-past ten A.M. The temperature of the body was then 105°, and a jaundiced tint of the skin was noticed for the first time. There had been three slight movements from the bowels since my last visit, which were attributed to the peritonitis. The condition of the stomach, however, had greatly improved. It was decided to return to the quinine in doses of three grains, every six hours. She was to take five drops of nitro-muriatic acid, every three hours, and milk punch in such quantities as she could bear, and at such intervals as seemed to be indicated. A vaginal examination was made, but nothing ascertained beyond the existence of an extensive cellulitis on the left side. The pulse gradually diminished in frequency, and the condition of the skin was remarkable, for while the temperature in the axilla or vagina was from 104° to 105°, the sense of touch could detect no unusual elevation on the general surface. She was sweating moderately all the time from blood poisoning, but where the body was not covered, the temperature on the surface was lowered by evaporation. Without the use of the thermometer we should have had no knowledge of her critical condition, for she no longer suffered from pain, and had been without opium for nearly twenty-four hours.

3d. The general condition had improved, the temperature had fallen to 103°, the pulse to 90; the yellow tinge in the skin had become less marked; there was no longer nausea, and her nourishment was all retained, when administered by either the stomach or rectum. Her condition seemed so favorable, that Dr. Thomas considered it unnecessary that we should meet for another consultation. Throughout the following day, April 4, there was no apparent change, with the exception that her strength was evidently not so good, and at times it seemed that her mind wandered, although she was perfectly rational when spoken to. About half-past one A.M., April 5, she sank into a collapse as suddenly as at the beginning, but did not react, and died at six o'clock A.M.

Five hours after death the autopsy was made, and by request it was confined to the abdominal cavity. General peritonitis existed, and, in the pelvis, on the right side, and around the intestines, was found a quantity of free pus. It was evident that the ovary had long been the seat of an abscess, which had gradually destroyed the whole organ, so that nothing remained of it but a sac. Nature had attempted a repair by encysting the sac, so that in all probability the contents of the abscess would have escaped into the rectum at some future time, if the rupture into the peritoneal cavity had not been caused by the sudden effort of turning in bed. Notwithstanding the symptoms of blood-poisoning, which were evident, she had begun to improve. As ample adhesions had taken place, the newly-formed pelvic abscess would eventually have opened into the rectum or vagina, and so she might have recovered, but the second unfortunate rupture of the sac into the peritoneum induced a shock from which she had not the strength to rally.

Enlargement of the Ovary.—In so-called chronic inflammation of the ovary the organ is generally enlarged, and when free from adhesions it prolapses, more or less, from the increased weight. It may occupy any point between its natural position and the bottom of Douglas's cul-de-sac, so long as it does not exceed twice its natural size. Where it has become hypertrophied to a greater degree, which is very unusual, it cannot reach so low a position in the pelvis, and will be the more likely to form adhesions. As with an inflamed testicle, the slightest pressure upon such an ovary will produce pain, and frequently nausea. The uterus is also enlarged, the cervix the seat of an erosion, and the organ itself is generally retroverted when the ovary is prolapsed.

A movement of the bowels will, for a time, increase the suffering in consequence of the relation of the rectum to the left ovary, this being the one which is usually affected. There will be an inability, on the part of the patient, to exercise or to stand for any length of time without adding to the feeling of discomfort.

There will be dysmenorrhœa, with the menstrual flow irregular both in duration and quantity. The surface of the ovary is usually smooth, while its texture is soft and boggy when the disease has not been of long duration. This condition frequently makes its appearance early in menstrual life, and if not relieved will in time be complicated by attacks of local peritonitis, or cellulitis. Ultimately the size of the ovary becomes greatly reduced and its surface roughened or corrugated. Menstruation, which may have been previously too free, will now become scanty and irregular. A woman subjected to either stage of this disease will seldom, if ever, be entirely free from pain, and at the time of the flow all the symptoms will be greatly aggravated; so much so that the existence of active inflammation will seem to be indicated by the occurrence of a chill, the increase of pulse, the pain, and pyrexia.

Under other circumstances there will be no prolapse of the ovary, or even appreciable enlargement, for the organ will remain beyond the reach of the finger. Yet the same disturbance of the nervous system will exist, menstruation will be as irregular, while the constant pain in the neighborhood of the ovaries and every other symptom will indicate that the same state of disease or irritation has been established in both conditions.

With all these various diseases the general health is greatly impaired, and, as a rule, a profound degree of anæmia exists.

Dr. Barnes[1] states: "We can hardly conceive an inflammation of the ovary, which recurs every month throughout thirty years, and which is, nevertheless, compatible with the continuance of the ovarian function. These symptoms, then, which, outside the menstrual epoch, would be considered to indicate inflammation of the ovary, may be produced by temporary hyperæmia and hyperæsthesia of the organ."

These views express very perfectly my own convictions. Often with every symptom to indicate a local disease, there will be no disease whatever in the ovaries, or if, by chance, some morbid change be detected, it will be but an effect of disease elsewhere.

The various symptoms of ovarian disorders are but an evidence that nature's laws have been put at defiance, and that the nervous system has been overtaxed.

Who are the sufferers from the condition which has been termed an irritable ovary? The young girl who has had her brain developed out of season; the woman disappointed or crossed in love by some man not worthy of her; those who have been ill mated, and, often, the unmated; she who has sold her person, under the guise of marriage, for money or position; the prostitute, and she who degrades herself, and sacrifices her womanhood by resorting to means to prevent conception. In all of these, the nervous system has been first abused, and then nutrition has suffered; some accident only locating the effects in the ovary.

We are unable to explain the fact that the extent of disease may be limited to what may be termed a congestive enlargement, due to obstruction in the venous circulation. The enlargement is evidently not from arterial congestion, for that would tend to inflammation, which if continued would lead to the breaking down of tissue, and the formation of abscess. This venous congestion may last for years, and from some unknown cause the ovary may be prolapsed, but only as an exception to the rule, for an ovary equally large and as free from adhesions will more frequently remain in place. Under this congestive influence the organ undergoes cystic degeneration, and remains stationary at nearly the same degree of enlargement for years. A rarer change is an early atrophy which presents the appearance of cirrhosis, but this has been already referred to.

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[1] Diseases of Women, American edition, p. 262.

Ovulation in an ovary in either of these conditions is generally imperfect, and is attended with dysmenorrhœa and other menstrual disorders.

Treatment.—It is difficult to afford any marked relief during the menstrual life of the woman. Within the whole range of the disorders to which women are liable, none, as a rule, present so unpromising an outlook as this, for both patient and physician.

A serious state of anæmia exists in all these cases, and the condition has already long reached a stage when it would be of little importance to determine what is the cause and what the effect. The close relation existing, through the sympathetic system, between the generative function and general nutrition has already been treated of. During the menstrual life of a woman, the dominant influence is that which is emitted from the ovaries, and which when normally directed is a most potent stimulus to healthy nutrition. It can then be readily understood that to correct this extreme state of anæmia, while ovulation itself is so imperfect, must be difficult. After the menopause, however, the sympathetic nerves again become dormant, in their relation to sexual functions, as before puberty, and are chiefly concerned in correcting and repairing the defects in nutrition.

There are many cases where, by judicious treatment at an early stage, health can be regained. In other instances, I have known the reparative powers of nature to prevail, after every artificial means had been resorted to, and the cases regarded as hopeless. We should then never despair in any case. But the prognosis often turns on the degree of judgment with which the case has been treated by the physician in charge of it at the beginning. Many a woman has been rendered incurable in consequence of the opium habit, contracted at the instigation of an ignorant or careless medical adviser. Of all drugs, none is more potent than morphine to produce anæmia, and to cause neuralgia by a long continuance of its own poisonous effects. I have seen several instances of so-called oöphoritis, in which morphine had been freely used for years to relieve pain over the region of the ovaries, and in which, under more judicious management, an improvement in the general health took place, and all pain disappeared in two or three months after the opium habit had been broken up. I have no doubt that there are cases of local neurosis due to pressure exerted by the contraction of ovarian tissue. In these cases the pain not only continues, but will become worse, if the use of anodynes be discontinued. But in the beginning, the ill-judged use of opium doubtless aids in producing an anæmia which would otherwise not occur; and it may even induce inflammation of the ovarian tissue, through its deleterious influence on nutrition. After a certain stage has been reached in the use of morphine, but few victims will have the courage to make a real effort to get rid of the evil; in fact, the chances for reform from the opium habit are less promising than those for a full restoration of the lowest drunkard from the gutter. But the attempt at reform must be the first step, and the habit must be broken up if possible, for as long as it exists no accurate idea can be formed of the local condition.

To direct any special course of treatment is impossible, since every function of the body will be impaired to a greater or less degree. The one great aim should be to lessen, if possible, the anæmia. Drugs will be of little service at first, but we may accomplish much by sunlight and fresh air. Whenever the circumstances will admit of it, the patient should expose her whole body to the sunlight, so as to secure its actinic effect on the blood in the capillaries, and the longer the better. Should she be too feeble to get about, she must be carried into the open air in favorable weather, to remain from morning until night. Hot water vaginal injections must be given night and morning, and such other appropriate measures instituted as have been fully detailed under the head of general principles. A change to a milder climate in the winter will aid greatly in removing the state of anæmia. Yet, after all, we will meet with a certain number of cases where every measure will fail, and the irritation will become gradually concentrated in the disturbance of the healthy action of some nerve centre. We may then have epilepsy or even insanity as a consequence, and for the relief of which no rule can be laid down.

Battey's Operation.—Dr. Robert Battey, of Georgia, in 1872, reported[1] a case of extirpation of the ovaries, and recommended the operation for the relief of cases of imperfect ovulation, marked by an "excessive menstrual molimen." The operation was termed by him "Normal Ovariotomy," and was only to be resorted to after all other means of cure had failed. The source of irritation, it was conceived, would be removed by the cessation of ovulation brought about by the extirpation.

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[1] Atlanta Medical and Surgical Journal.

In a more recent paper[1] Dr. Battey states: "In doing these operations I have sought to effect a cure of the varied maladies complained of by the removal, in certain instances, of an ovary viciously or abnormally performing its function, and more frequently by the removal of both ovaries to put an end to ovulation entirely, and thus to determine the menopause, or change of life; whereby I have hoped, through the intervention of the great nervous revolution which ordinarily accompanies the climacteric, to uproot and remove serious sexual disorders, and re-establish the general health." "The operation was supposed by many to have been also recommended for the relief of nymphomania. This has been distinctly stated as not being correct, since there is no reason to expect its cure by the arrest of ovulation."

Dr. J. H. Aveling has shown[2] that the operation for extirpating the ovaries from the human female is a very old one, and has been long practised, for various purposes, by the Eastern nations. He also states the fact that Dr. Jas. Blundell presented a paper to the Royal Medical and Chirurgical Society, June, 1823, in which he points out that the healthy ovaries could be removed with safety. Two years afterward Dr. Blundell published his "Researches" in a small volume, from which Dr. Aveling quotes:—

"THE EXTIRPATION OF THE HEALTHY OVARIES.—This operation, even granting it to be safe, can scarcely in any instance be necessary, though it may be observed, by the way, that it would probably be found an effectual remedy in the worst cases of dysmenorrhœa, and in bleeding from monthly determination on the inverted womb, where the extirpation of the organ was rejected."

Dr. Aveling states: "As a matter of fact, Prof. Hegar, of Freiburg, was the first to perform spaying as a medical operation; but it is to Dr. Battey that the credit belongs of having popularized the operation and pressed it upon the attention of the profession. To him also belongs priority of publication."

Dr. Battey's name must always be associated with this operation:

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[1] Transactions of the American Gynecological Society, 1876, p. 102.

[2] The Spaying of Women, etc.; Obstetrical Journal of Great Britain and Ireland, [illegible] p. 617.

for in justice, more credit should be granted to the successful popularizer, by whose efforts suffering humanity may be benefited, than to the originator, whose claims would have been otherwise unknown.

The operation was performed by Dr. Battey, in most of the cases, with the patient on the left side, and by the aid of Sims's speculum. The cervix was drawn down to the pubes by means of a strong hook, where it was held while Douglas's cul-de-sac was opened from the vagina by means of a pair of scissors. On reaching the ovary, with the finger as a guide, it was seized by forceps or tenaculum, and drawn out into the vagina. It was then separated by the écraseur, or, being secured by a silk ligature, it was cut off, and the stump returned into the cavity, the opening being left to close gradually, so as to admit of drainage.

The position of the patient causes the intestines to gravitate so that they are out of the way during the operation. The cul-de-sac is, however, generally empty, under ordinary circumstances, and after the operation the presence of the stump and rapid adhesions prevent a prolapse of the intestines into the vagina. The operation can be readily done in this position, so long as the ovary happens to be free from adhesions. When adhesions exist the ovary is to be removed by gouging it out piecemeal with the finger nail. The danger of hemorrhage then presents itself, and may be beyond control, and there is a possibly incomplete removal of the ovary. Dr. Battey has thus far reported ten operations by the vagina, and two by abdominal section.

Dr. Sims has recorded[1] his experience, and, after presenting all the cases which have been operated on by others, has decided in favor of the operation which he designates "Battey's operation."

He states: "The inferences that I draw from this analysis of Battey's and my own operations are these:—

1st. Remove both ovaries in every case.

2d. As a rule, operate by abdominal section, because if the ovaries are bound down by adhesions, it is possible to remove them entire, whereas by the vaginal incision it is impossible.

3d. If we are sure that there has been no pelvic inflammation, no cellulitis, no hæmatocele, no adhesions of the ovaries to the neighboring parts, then the operation may be made by the vagina, but not otherwise."

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[1] Battey's Operation, by J. Marion Sims, A.M., M.D.; British Medical Journal, December, 1877.

Dr. Goodell (Am. Jour. of Med. Sci., July, 1878) reports[1] six cases in addition to those collated by Dr. Sims, namely—one by Nussbaum, two by himself, and three by Dr. Engelmann, making in all thirty-four cases.

Dr. Goodell prefers the vaginal method, and if he found it impossible to remove the ovaries in that direction on account of adhesions, or other causes, he would resort to the abdominal section, leaving the vaginal incision for deep drainage.

He advocates the use of the term "spaying," as had been suggested by Trenholme, of Montreal, to express this operation.

Dr. Engelmann, of St. Louis, Mo., has reported[2] in the American Journal of Obstetrics July, 1878, his three cases, together with a full analysis from the histories of all the cases of "Battey's operation" which have been placed on record. Another paper from his pen appears in the Transactions of the American Medical Association, 1878, on the same subject.[3]

The following, giving the names of the surgeons, the number of operations and deaths, has been compiled from Dr. Engelmann's article in the Am. Jour. of Obstetrics.

	Operations.	Deaths.
Battey, Georgia	12	2
Sims, New York	6	1
Hegar, Freiburg	4	1
Goodell, Philadelphia	3	1
Thomas, New York	2	1
Trenholme, Montreal	2	0
Peaslee, New York	1	1
Sabine, New York	1	0
Gilmore, Alabama	1	0
Pallen, New York	1	1
Engelmann, St. Louis	3	3
	36	11

The histories of forty-one cases are given by Dr. Engelmann, but in only thirty-six of these was the operation completed or the result known.

Two operations by Hegar, one by Kaltenbach, and one by Freund were excluded from the above list, as the results were not known. But these cases are given in the Transactions of the Am. Med. Association, together with another case by Martin, of Berlin. The following are his views as to the danger of the operation:—

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[1] This paper has already been alluded to in the chapter on the Surgical Treatment of Fibrous Tumors of the Womb.

[2] Battey's Operation: Three Fatal Cases, with some Remarks upon the Indications for the Operation.

[3] The Difficulties and Dangers of Battey's Operation.

"The dangers of the operation, as far as we can now judge from the 43 cases completely reported, are greater than has been supposed, and the percentage of fatal cases in Battey's operation, as compared with the results of ordinary ovariotomy, bears out my assertion that the former is the more difficult and more dangerous operation."

"Fourteen of the 43 cases operated on, 32.55 per cent., proved fatal; 29, or 67.44 per cent., recovered. Of the 27 cases in which the operation was performed on account of direct ovarian suffering, 9, or 33.33 per cent., proved fatal, and only 18, or 66.66 per cent., recovered."

Dr. Engelmann shows conclusively the advantages of the abdominal section, and his preference for this method.

At the close of the chapter on the treatment of fibrous growths of the uterus, reference was made to a recent paper by Prof. Hegar, on this operation, an abstract of which was published in the *Am. Journ. of Obstetrics*, N. Y., Jan. 1880. It is there shown that he has employed the operation in a somewhat wider range than has been done in this country. But he maintains that before resorting to the operation, "we must pre-eminently adhere to the principle that all of our other therapeutic measures shall first have been exhausted. Furthermore, I must insist on the pathologico-anatomical alteration of the ovaries themselves, or of the uterus and its appendages, as the basis of the indication. To consider mere functional disturbances as indications, as the Américans sometimes do, does not appear justifiable to me."

Since closer attention has been paid to the employment of antiseptic precautions in this operation, the rate of mortality has been greatly lowered. Prof. Hegar states "The mortality in my operations (42 cases) amounts to 16.6 per cent. Among 47 castrations performed by others, with which I am acquainted, I find fifteen deaths, or 32 per cent."

Dr. Paul F. Mundé,[1] the editor, sums up the whole matter in a foot note to Prof. Hegar's article in the following manner: "Adding to 51 previously reported cases, with 16 deaths, these 42 of Hegar, with 7 deaths; 16 by Freund, Schroeder, Langenbeck, Martin, Müller, and Czerny, with but 2 deaths; 10 by Noeggerath (unpublished), 2 deaths; 1 by Goodell, fatal; and 1 by Battey, recovery (unpublished); we have 120 cases of Battey's operation, with 28 deaths, or 22.6 mortality. If the positive benefits of the operation were as assured as its rate of recovery, the opposition to it would soon cease."

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[1] Am. Journ. of Obstet., Jan. 1880.

My experience of the operation has been limited to one by Dr. Thomas, where, although both ovaries were removed, the woman was only temporarily benefited, and one by Dr. Peaslee which resulted in death. I agree with Dr. Sims as to the necessity of removing both ovaries if the operation is called for, since it is evident from the records before us that a favorable result is not to be expected unless its cessation of ovulation is accomplished. Until the proportion of deaths is much lower, and that of benefit increased, the class of cases must remain a limited one in which a resort to the operation would be justifiable.

With my present knowledge of the yet unsatisfactory results, my consent to the operation would be limited to extirpation of both ovaries for the arrest of hemorrhage from a fibrous tumor, and in cases of threatened insanity, epilepsy, or phthisis. For nervous disturbances which present more of the hysterical element, the operation should never be thought of. In many such apparently desperate cases I have seen a little moral suasion, administered with firmness, accomplish a great deal, and nature will often, when aided, bring about a favorable change in nutrition when least expected. The operation may be more frequently necessary in the present generation than it ought to be in the future, since a large number of cases calling for it have, under injudicious management, been already rendered incurable by other means. But I hold that in the future this ought not to be so, for our enlarged opportunity for acquiring skill in the treatment of uterine and ovarian diseases should enable us to raise our patients above the necessity for such a terrible ordeal.

I am fully convinced, if the views set forth in the first chapter of this work were more generally adopted, that many nervous disorders now common, and for the relief of which this operation is performed, would in future generations be rarely met with. Prof. Hegar, in the article previously referred to, evidently appreciates the consequences of faulty training in many of these cases, for we find "much may here be accomplished in a prophylactic way. Improved education and physical care of the growing young girl, recognition and treatment of the affection in its first incipiency, will diminish the number of these unfortunates, though they will not quite eradicate it."

CHAPTER XXXVII.

TUMORS OF THE OVARY.

Solid (fibrous) tumors—Cystic tumors: follicular cysts; compound cystomata; myxoid and dermoid cystomata; cystoma proliferum papillare; C. parviloculare; C. sarcomatosum (cystosarcoma); C. myxomatosum—Retrograde metamorphosis of cystomata: fatty, sclerotic, atrophic, hemorrhagic, purulent, spontaneous perforation—Development of cystomata.

THESE may be divided into solid and cystic tumors. The solid tumors may be subdivided into fibrous, cancerous, and sarcomatous; and the cystic tumors into follicular cysts, dermoid cysts, and compound cysts.

Solid tumors.—These are exceedingly rare, slow of growth, and seldom reach a large size.

Fibrous tumors of the ovary, unlike those in uterine tissue, involve the whole organ; they frequently undergo partial degeneration into bony and sometimes cartilaginous structures. It is often difficult to make a diagnosis between fibrous ovarian tumor and pedunculated fibrous tumor of the uterus, and the former can be distinguished from a cystic tumor of the ovary only by the difference in density.

A woman with a fibrous tumor of the ovary may suffer a certain amount of disturbance from pressure, but as the growth is slow, and seldom reaches any magnitude, there will be little call for interference. Sometimes, however, its removal may be necessary, as local peritonitis may follow and cause ascites, and the tumor may attain such a size and weight as to demand removal.

The operation for the removal of an ovarian fibrous tumor must necessarily be the same in principle and detail as that to be described hereafter under the head of ovariotomy.

I have met with several supposed fibrous tumors of the ovary, but they were all too small to call for any interference. The only cases on record in this country, where the fibrous tumor reached a size to make its removal necessary, were two operated on by Dr. Wm. H. Van Buren of this city, one in 1849, and the other in 1850. Dr. Peaslee, in his work on Ovarian Tumors, gives Dr. T. G. Thomas the [illegible] with [illegible] practical [illegible] dif- [illegible] malignant disease. [illegible] malignant disease

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which was confined to the ovary. In fact, when the ovaries are involved, it is, as it were, the last stage of disease which began elsewhere in the pelvic tissues.

Cystic Tumors of the Ovary.

Follicular cysts are the most common, and at the same time the least important of the cystic growths of the ovary. They rarely ever reach a size to produce inconvenience, or to be recognized during life. According to Schroeder,[1] "the dropsy of the Graafian follicle represents a so-called retention-cyst, and is to be considered in the same group with tubal dropsy, hæmatometra, etc." "They occur singly, or the whole ovary becomes, through a repetition of the same process in numerous Graafian follicles, converted into a tolerably large tumor, which presents on section a multilocular cystic appearance." (Waldeyer.) "These cysts have a smooth wall, no projecting septa, and their contents consist of a clear, transparent serum. The origin of the cysts is doubtless partly owing to the causes which hinder the rupture of the follicle. Sometimes, when a follicle is physiologically mature, rupture fails to take place, either because the ovum has not progressed towards the free surface of the ovary, or because the surface of the ovary is covered with an exudation, the product of some inflammatory process, which prevents the rupture taking place. In many cases, doubtless, the follicle is obliterated, but the secretion may remain, and so give rise to the production of a cyst." "It is, moreover, possible, as Rokitansky (*Allg. Wiener Med. Z.*, 1859, No. 34, Lehrb., 3 Aufl., p. 48) first demonstrated, for a cyst to form from a ruptured Graafian follicle, in other words, from a corpus luteum, probably in this way; after the closure of the opening where the rupture took place, and after the formation of the corpus luteum, the latter becomes a cyst. I have myself seen one such case, in which there was a cyst of the corpus luteum in the ovary of a patient who had died of hemorrhage during a miscarriage. Next to the wall of the cyst came the yellow layer of the corpus luteum, and then the white coat of the ovary."

Compound Cysts.—But little exact knowledge has yet been attained in regard to the cause or origin of these growths.

No author, from his own observation, has heretofore described their condition with so much clearness as Waldeyer.[2]

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[1] Ziemssen's Cyclopædia, Am. ed., vol. x. p. 362.

[2] See Archiv für Gynækologie, Erster Band, Zweite Heft, s. 252.

Schroeder (*Ziemssen's Cyclopædia*) has briefly given these views, but in no other form, to my knowledge, have they reached the English reader. I regard the subject, as presented by Waldeyer, to be of sufficient importance to give his views at greater length than has been done, and, while they will not be quoted literally, the remainder of the chapter will be devoted to presenting them in substance.

Waldeyer, who designates the compound cystic growths of the ovary as "Cystomata," subdivides these tumors into two essentially different groups, viz.:—

(*a*) *Myxoid Cystomata*, of which the inner surface exhibits quite the appearance and behavior of an ordinary mucous membrane abundantly provided with glands and vessels, and

(*b*) *Dermoid Cystomata*, of which the inner surface shows the character of an external skin invested with epidermis.

The Myxoid Cystomata usually form large unilocular or multilocular sacs, of the size of a man's head and larger, so that they may contain as much as fifty to a hundred quarts (litres) of fluid. They may appear on one side or on both sides. The pedicle of these tumors is formed by the ligamentum ovarii, the tube, and the ligamentum latum, the latter containing numerous vessels often very large. The longer and thinner the pedicle, the firmer is it apt to be, and it contains pre-eminently fibrillary connective tissue, and a few smooth muscular fibres. In rare cases the pedicle is entirely wanting, and the ovarian tumor sits immediately on the uterus with a broad base. The components of the cystomata are the main cystic walls, the secondary cysts, the proliferations of the inner and external surface, and the cystic contents, generally fluid.

The main cystic wall, inclosing all the other structures, forms the external boundary of the tumor, and usually incloses also a main cystic space which has always been formed, perhaps, by a confluence of several smaller primary cysts. Into this main cyst project almost all the secondary cysts, and from its wall stand most of the glandular and papillary vegetations, and it also conceals the principal mass of the contents. The older the cystoma, the larger in general becomes the principal cystic space, and finally the cystoma becomes unilocular, all the secondary cysts being blended with the chief cyst. In the smaller or younger cystomata, it is true, a principal cystic space cannot be discriminated, and they form rather solid walls, on the section of which we find numerous small cysts with gelatinous contents. The blending process of the secondary cysts, with the principal cyst, is first of all introduced by a thinning of the walls of the secondary cysts, incident to their growth. Later a perforation takes place into the principal cyst, or into a neighboring secondary cyst, after which the perforated cyst ceases to grow, and atrophies. The opening that has originated becomes larger and larger, and the space within the opened cyst becomes flatter and flatter, until at last only a flat dish-shaped depression remains in the wall of the principal cyst. The formations appearing by further development on the inner surface of the principal cystic wall are, in a certain series of cases, pre-eminently of a glandular nature, and in the sections through the cystic wall everywhere show small, single, tubular epithelial recesses, and in this way the *cystoma proliferum glandulare* originates. The openings of these tubules are soon obliterated by the tenacious secretion, and thus dilatations originate that are transformed into just so many small cysts, like retention-cysts. New glandular formations soon proliferate from the inner surface of the small cysts, and this process advances in continuing succession, so that these small cysts are ranged, story upon story, as it were, and generate forms that have the greatest similarity with a honey-comb.

In other cases numerous villous and dendritic vegetations, varying in size, sprout from the inner surface of the principal cystic wall. In some cases these growths are limited to a small space, only proliferating in places here and there, but in others they multiply to an incredible degree, filling up the entire cystic sac, thus constituting the *cystoma proliferum papillare.* They are generally very vascular, and their basis consists of the connective tissue of the inner layer of the cystic wall well supplied with cells. In form they are sometimes as fine slender filaments, or short ones, again as broad or high masses, ramifying as compound papillæ. At times these vegetations perforate the principal cystic wall, and proliferate in the abdominal cavity. Waldeyer explains the fact that adhesions of these cystomata with the neighboring parts are so rare by the peculiar nature of the ovarian epithelium. This consists of cylindrical cells, which bestow upon the surface of the cystoma the character of a mucous membrane, and, therefore, prevent adhesions forming so long as the entire surface of the tumor remains intact. But after the epithelium has been lost, which generally occurs in the larger cystomata as the result of friction against the abdominal walls, inflammation is excited, and adhesions take place generally to the abdominal walls, the omentum, and the uterus, but rarely to the intestines, which are so constantly in motion.

The principal cystic walls, and the walls of the somewhat larger secondary cysts, consist of two layers, an external connective tissue stratum, rather dense, of parallel fibres, and a much thinner inner stratum, very well provided with cells and vessels, on which the epithelium immediately sits. The smaller cysts are only surrounded by the last-mentioned stratum. Waldeyer maintains that the epithelium is always a cylindrical one, and covers the inner surface of the cyst in a single layer. Eichwald states that he found pavement epithelium, and others report that they have discovered ciliated epithelium in a few rare cases. In the glandular cystomata, the epithelium sinks from point to point into the depth of the cyst walls in the form of a glandular knob with a central lumen, and thus forms flask-like or cylindrical glands, which are generally very short.

The contents of ovarian cysts generally consist of a somewhat opaque brownish-red, or dirty yellowish-gray, dense stringy mass, of the specific gravity of 1018–1024. The chemical composition of the substance contained in these cysts will be referred to hereafter at some length, when, in comparison with that of other abdominal fluids, the subject will be considered in its relation to diagnosis.

Waldeyer considers the contents of the cysts to be due in a great measure to a metamorphosis of the protoplasm of the cells. This metamorphosis is very frequently attended with the destruction of the epithelial cells, for if we examine fresh gelatinous masses, lying immediately on the inner surface of the cysts, we always find a quantity of clear cells distended to roundish vesicle-like forms, with a quantity of cell detritus, varying in size and form. It is thought, in addition, that each one of these goblet-shaped epithelial cells, frequently present, may perform the functions of a unicelled gland for a time, until it finally undergoes destruction. At the same time it is scarcely necessary to state that an admixture of a simple transudate is not to be excluded.

As varieties of the cystomata, Waldeyer mentions—

1. The cystoma parviloculare, which is composed of a great number of smaller cysts, and constitutes rather compact masses, with a sectional surface like a honeycomb, has an independent existence, or constitutes the appendage of a large principal cystic space.

2. The cystoma sarcomatosum (cystosarcoma of the older writers), in which a sarcomatous texture of the walls, especially of the younger secondary cysts, may be perceived, and—

3. The cystoma myxomatosum, in which we find a myxomatous condition in the inner layers of the walls of the principal cysts and secondary cysts, and the papillary proliferations starting from them.

As processes of retrograde metamorphosis of the ovarian cystomata, Waldeyer describes—

1. The fatty degeneration of the epithelial cells and the cells of the connective tissue parietal stratum, which rarely appears to any great extent.

2. The sclerotic condensations of the connective tissue in the principal cystic walls.

3. The wasting away of the cysts, proceeding from the destruction of all the secondary cysts and the atrophy of the glandular formations of the inner cystic wall and its epithelium, with which ceases all power of proliferation, and all secretion of the cystoma, the latter then remaining stationary. This process, only observed in the glandular cystomata, is the consequence of the pressure that the constantly accumulating cystic contents exercise in a certain toughness and unyielding condition of the walls.

4. Hemorrhages in the interior take place pre-eminently in papillary cystomata from the very vascular papillary proliferations.

5. The acute purulent inflammations start from the inner parietal layer of the cystoma which is well provided with cells. The abundance of the cells is then so increased that all the fibrous elements among them disappear, the vessels are dilated and contain colorless blood-corpuscles in large number. In places here and there, the epithelium in large tracts is detached from the wall of the cyst by the pus cells breaking through it, the pus pervades this epithelium and accumulates on its other side, so that the epithelium is bathed by the pus on both sides. At the point where the epithelium is detached from its substratum vascular loops soon sprout up.

6. The spontaneous perforations of the cystic walls, either originate through extended fatty metamorphosis, or the cause is to be found in extensive papillary proliferations or suppurations, or gangrenous disintegration.

The ovarian cystomata develop from a hyperplastic formation of the tubules of Pflüger, and consequently can be traced to the epithelial constituents of the ovaries; *they are genuine epithelial neoplasms.* Two histological elements are represented in the ovary from its first development, the vascular stroma and the ovarian epithelium. The mass of the ovary now originates by a mutual intergrowth of the vascular stroma and the epithelial seated, it is true, in the beginning, only on its surface, with a constant increase of the two constituents. This process lasts perhaps up to birth. In this manner a roundish organ, the ovary, grows in place of the germinal epithelium expansion, originally quite flat, in which, from the process of intergrowth, a quantity of epithelial elements is imbedded. These lie in the beginning quite disordered, and densely crowded in the meshes of the stroma, so that the section of an embryonic ovary shows quite a cavernous structure. Later, the vascular stroma increases more, while the imbedded epithelial heaps remain about equal in quantity, the latter, as a matter of course, are removed wider apart. Many of them being segregated into round follicles, other epithelial balls remain still a long time united together in the form of a chain or rosary (Pflüger's tubules), until also here, by the continually advancing development of the vascular stroma, the separation into individual follicles takes place generally around an ovular cell.

In the development of a cystoma, we have in the adult ovary quite similar relations, only there are no regularly constructed follicles with epithelial cells and ova in them. On the contrary, we find very irregularly formed epithelial deposits in the stroma, which is likewise somewhat increased, but they nowhere inclose an ovum.

If it be asked how these embryonic formations happen in the ovary of an adult, the answer must be either that the first development of the ovarian cystoma is to be dated back to a very early period, or that still later there is also a development of the embryonic forms, the tubules described by Pflüger. Both are possible, for on the one part cysts have been observed in the new born, and the most, even the largest ovarian cystoma, are to be referred to a relatively early period of life. Yet, it cannot be denied that a past embryonic development of follicular rudiments may appear as a pathological process. In favor of this view is the appearance, sometimes observed in rather old women, of small cysts, clear as water, situated close under the surface of the ovary. These are constructed quite like ordinary ovarian cystomata, they never contain ova, and at times stand in direct connection with the superficial epithelium, so that the transition of the superficial epithelium into the cystic epithelium cannot be doubted. They are produced accordingly by an additional pathological implantation of epithelium in the stroma. Moreover, at some time after birth, remains of the tubules of Pflüger are found in the ovary which have not been constructed into individual follicles, and these remnants of tubules may very well give rise to pathological transformations. Finally it is not to be forgotten, that a new growth of epithelial cells takes place also in the formation of the corpora lutea, after the evacuation of the ovum, and these are penetrated in an irregular form by connective tissue processes of the stroma containing vessels. It is true, under normal relations, the epithelial cells perish later by fatty degeneration, and only the connective tissue, shrunken to a cicatrix, remains as the corpus albicans, but under pathological relations, the epithelial cells may also continue to exist and grow to glandular masses.

If it be admitted, as Waldeyer believes he long since demonstrated, that the superficial epithelium of the ovary is not serous epithelium, like that of the peritoneum, but is a genuine mucous membrane epithelium, like that of the Fallopian tube, with which it is often continuously connected, the cylindrical cells only devoid of cilia; and if, in addition, it be proved that the epithelium of the tubes of Pflüger, and of the Graafian follicles, is derived from the superficial epithelium by a process of intergrowth; and if it is also admitted that the proliferating cystomata originate from the tubes of Pflüger, then the epithelial character of these tumors is simultaneously demonstrated.

The further growth and development of the primary small cysts into the large complicated tumors are to be referred to the cyst wall itself. In many of the primary epithelial formations, scarcely yet distended to cysts, as well also in large tumors in the smallest secondary cysts, we see, here and there, recesses in the form of tubes. In the latter case, small epithelial sacs penetrate in many places from the wall into the inner layers of the connective tissue of the cystic wall, and the beginning of the cystic formation can be often discovered in them by the saccular dilatations of the blind, or closed, ends of the tubes. These tubes open with roundish apertures on the inner surface of the walls of the cyst, and are often blocked up by a tenacious gelatinous plug. This is made the more evident when the contents of the cyst are of a very tenacious character.

The secondary cysts of the ovarian cystomata resemble, in reference to their origin, the retention cysts in other organs. According to Boettcher,[1] cystic spaces may also originate in the following manner: As the process of proliferation goes on in neighboring glandular tubes, the walls of the stroma separating them become perforated, and thus cut off many glandular proliferations that are blended together, a rather large epithelial space is formed, naturally with many recesses. The entire developmental act of a proliferating cystoma proceeds consequently from the roundish, or tubular epithelial masses, forming the precursors of the Graafian follicles. The transformation of these epithelial masses may either begin already in early childhood, when such tubes are still present in large quantity, or they are new formed in consequence of a pathological process. In one, or in many of these epithelial groups, the epithelium begins to proliferate; they grow on all sides into ovarian stroma, combine with one another now in a manifold way, and these form exceedingly irregular shaped spaces, and ova are never met with in these formations. A secretion soon begins in these spaces, and in this way they are expanded into cysts, but at the same time numerous glandular and papillary proliferations start from the epithelium of their inner surface, and they are constricted to secondary cysts, or fill up the space within the first cyst more or less. In the secondary cysts the same processes are carried on, and so it continues in uninterrupted succession. A large number of the secondary cysts coalesce with the principal cyst, and it enlarges as well in this way as by a continuous increase of its contents. Finally, the retrogressive or other pathological processes appear, which either terminate the growth of the cystoma, or put an end to the life of its possessor.

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[1] Virchow's Archiv, 49, 3 Heft, s. 307.

Dermoid Cysts.—In regard to the development of the dermoid cystomata Waldeyer conjectures that it may take place as follows, although he admits that his views are not based upon the investigation of recent specimens. Each ovarian epithelial cell, he thinks, may become an ovular cell, and each ovular cell may produce all possible cellular characters, by division; and further, the corneal layer is the first product of segmentation. Now it may very well be assumed that the epithelial cells of the ovary, in conformity with their significance as undeveloped ovular cells, furnish, in their multiplication or division, and by budding, other products, and in fact such as are further advanced in the direction of an incomplete embryonic development than they themselves are. He does not consequently trace the dermoid cystomata in the ovary to actual fœtal remains, but to possibly fœtal inclosures, nor does he consider them as results of perverse ovarian pregnancy. He assumes a mode of development that runs completely parallel to the course of development of the myxoid cystomata, but in which the new formed epithelial cells of the cystoma assume a different character; in fact, they are epidermoidal in structure.

We have given in brief Waldeyer's views as to the development of these growths in the ovary. But while they are found in the ovary as a rule, they also sometimes develop in other organs, for which circumstance I can offer no explanation. These tumors, when situated in the ovary, develop very slowly, and never attain to the size reached by the cystomata. They are lined by a secreting surface from which the fluid contents are chiefly, if not entirely, derived, and to the accumulation of the secretion is due the increase in size. This lining membrane, giving the character to the tumor, has the properties of skin-tissue, with sebaceous and hair follicles, and, according to some observers, even sweat glands have been found. The fluid contents of these cysts are of a greasy consistency, resembling in appearance pea-soup or gruel, according to its degree of density, but in which can be seen many glistening points due to crystals of cholesterine, which often exist in large quantities. The solid contents are teeth, quantities of hair, and great portions of bony structures in which teeth are frequently found growing, or as bony scales buried in the cyst-walls. The hair is generally of a red color, growing from follicles in the lining membrane, and is frequently found of greater lengths rolled up into balls.

Dermoid cysts are often developed in early childhood, and as a rule are recognized previous to the period of life when the cystomata are more common. It is evident that these cysts are much more liable to take on inflammatory action than any other growths developed in connection with the ovary. As a consequence they are often the seat of abscesses, and, becoming encysted by a cellulitis, the pus finds its way generally into the rectum, and less frequently into the vagina, and by this means a channel is furnished through which the solid contents are also evacuated. A few cases have been placed on record where dermoid cysts have emptied into the bladder, an accident which would add to the difficulty; yet if recognized they could, by removal of their contents through an incision in the base of the bladder, be as advantageously treated as in any other locality.

CHAPTER XXXVIII.

CYSTIC TUMORS OF THE OVARY (Continued).

Unilocular cysts (monocystic, oligocystic)—Multilocular cysts (compound proligerous, polycystic)—Stages—Rapidity of development—Symptoms—Diagnosis.

We have seen in the preceding chapter that these tumors may develop apparently as a single cyst, although in reality this never occurs; and that on account of the number of cysts of all sizes, in a common sac, they sometimes have the appearance of a solid mass. When the accumulation is contained within what is practically a single cyst, the condition is designated by different writers as a unilocular cyst, a monocystic or oligocystic tumor. When formed of many cysts, the growth has been termed a multilocular, or compound cyst, a proligerous cyst, or a polycystic tumor. I shall employ the term unilocular to express the simple, or essentially single cyst, and multilocular, for the compound, or tumor formed of many cysts.

Dr. Peaslee[1] has conveniently divided the development of an ovarian tumor in the following manner:—

"First stage. The cyst is still within the pelvis.

"Second stage. The upper extremity of the tumor has risen out of the pelvis, and is extending to the level of the umbilicus.

"Third stage, includes the growth upward from the umbilicus to the epigastrium.

"Fourth and last stage, is that in which the growth of the tumor is such as to increase its prominence and circumference alone, it having risen in the preceding stage to its highest point.

"It is also convenient to speak of the middle of the second stage, the tumor reaching halfway from the symphysis pubis to the umbilicus, and the middle of the third stage, when it has attained to the point midway from the umbilicus to the ensiform cartilage."

The interval which must elapse between the time when the growth has just reached a size to be detected by the patient and when the increasing development will call for surgical interference must vary according to the age and temperament of the individual, and the character of the growth.

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[1] Ovarian Tumors, their Pathology, Diagnosis, and Treatment, etc., by E. Randolph Peaslee, M.D., LL.D.

These tumors are developed with most rapidity in middle life, or about the time for the final cessation of the menstrual flow. The rapidity is generally in proportion to the number of cysts composing the mass. The average time for a multilocular tumor is about a year, and for a unilocular from a year and a half to two years after it has reached a sufficient size to rise out of the pelvis, and the patient becomes conscious of its existence. But little data are to be obtained as to the average length of time of the first stage of development; but it is always a long one. In several cases under my observation, the character of the tumor was recognized two to five years before the patient herself became aware of its presence, or had suffered from any inconvenience beyond what was attributed to a supposed uterine disease. The capacity for enduring the pain and discomfort of a tumor varies in a remarkable manner with different individuals; hence the time at which it becomes imperative to interfere also varies. Instances occur where the presence of such a growth in the pelvis will establish so much local and mental irritation, that a resort to surgical means becomes necessary long before the completion of the first stage, while others bear the most advanced degree of distension with but little inconvenience.

As a rule, unless some cellulitis is established, little pain or inconvenience will be experienced in the early stage of development. Sometimes the symptoms of pregnancy are present, as nausea, enlargement of the abdomen, and pain in the breasts. The menstrual flow, however, is rarely absent, and if changed in character may become more painful and freer. Constipation, in a degree natural to the sex, is almost always increased, but a tendency to diarrhœa may take its place. Many experience a greater or less sense of pressure, or distension, while standing, somewhat similar to what is felt with retroversion.

On vaginal examination, a fluctuating mass will be detected on one side of the uterus, or filling up the posterior cul-de-sac, the uterus, as a rule, lying in front of the tumor, and anteverted. This condition may be mistaken for a cyst of the broad ligament, for a hydrosalpinx, or dropsy of the Fallopian tube, for extra-uterine or tubal pregnancy, and possibly hematocele. But it is inexcusable to confound it with retroversion, a fibroid on the posterior walls of the uterus, or with any stage of cellulitis. Time may be necessary to determine the true character, if the tumor is situated in the ligament, tube, or ovary. As long as it remains in the pelvis, it is often impossible to make a diagnosis, unless some of the fluid is obtained for examination by aspirating through the vagina; and this may be done if any urgent reasons are apparent. In extra-uterine pregnancy, the uterus is always found enlarged, and the cervix soft, while often symptoms of pregnancy will also exist, and more or less constant bloody uterine discharge. In these cases the uterus is generally displaced somewhat laterally, and the mass occupies a lower position at the side of the vagina, and is in closer relation with the uterus itself, than an ovarian cyst ever is, or a tubal dropsy, or a cyst of the broad ligament at so early a stage of development. Moreover, a difference exists in the shape of these several growths, which can be recognized by a digital examination per rectum. The ovarian cyst is almost always round and uniform in shape; a cyst of the tube is irregular, as if twisted upon itself, and generally largest at the ovarian end; and in tubal pregnancy the sac can be felt spreading out laterally away from the uterus, and ballottement can be frequently gotten, between the second and third month. Or by letting the finger rest under the sac, quietly in the rectum, an impulse can be felt transmitted from palpation over the abdominal walls, conveying the impression that a somewhat solid body impinges on the finger, and lies free in the fluid. The ovarian cyst should not be mistaken for hematocele, for if the history should give no indication of the condition, the finger will readily recognize that the cul-de-sac is filled as it would be by a fluid settling into it. But quite a different impression will be given with a cyst distended by fluid, which preserves its own special outline, while it merely rests in this locality.

When the tumor has enlarged sufficiently to rise out of the pelvis, the second stage begins, and fluctuation may be detected, and the mass can be easily moved in any direction, since a pedicle, which did not exist in the first stage, now becomes formed by the traction exerted. The fundus of the uterus is crowded at first to the opposite side, and then gradually displaced from before backward, until at length the whole organ is retroverted, and lies behind the tumor. This change in the position of the uterus almost always takes place at this stage, unless pelvic adhesions have been formed. By means of the sound, or with Sims's elevator, locked at the proper angle, it is easy to judge, from the degree of mobility, as to the connections between the uterus and the ovarian tumor. There will be more irritation of the bladder excited by the upward traction of the growth, and, as it increases in size, the bladder will gradually be forced under and behind the tumor. An ovarian tumor may be mistaken for pregnancy at this and subsequent stages, if the examination is not carefully made.

After the growth has reached the umbilicus, the third stage of development is begun. The small intestines are crowded behind the tumor, so that the whole anterior face of the abdomen will be found dull on percussion, except along the course of the colon, and the fluctuation in the tumor will be more distinct.

The fourth stage is marked by an advance in the growth, and really is only an exaggeration of the condition already existing ; there is more discomfort, and usually there now appears the first evidence of functional derangement. The earliest manifest functional disturbance, resulting from pressure, is generally a diminished action of the kidneys. Digestion next suffers, with loss of appetite, irritability of the stomach, and either diarrhœa or constipation. The proper degree of nutrition is no longer maintained, the woman begins to lose flesh from about her neck and chest, the face grows thinner, and the cheek bones more prominent. The whole expression becomes so characteristic as to have been termed by Mr. Wells, the "facies ovariana." The healthy action of both the lungs and heart is early interfered with, and as the circulation becomes more and more obstructed, the veins over the surface of the abdomen enlarge, œdema occurs in the lower extremities, and sometimes in the most depending portions of the abdominal wall, and capillary action becomes so feeble that the skin is rendered dry and inactive.

The time has now arrived when relief must be speedily obtained, and the pressure exerted by the tumor must be lessened or removed, or the patient will sink rapidly from exhaustion, and ultimately die of hectic.

Pregnancy has formerly been mistaken for an ovarian tumor at the beginning of the fourth stage, but it is unnecessary to discuss the differential points, since the mistake should never occur at the present day. The two may coexist in different stages of development, and thus might render it difficult for us to make a positive diagnosis without resorting to measures which would entail the risk of producing a miscarriage. Nevertheless, with proper care and repeated examinations, we may be able to avoid falling into serious error. When the abdominal cavity becomes distended by ascitic fluid after the intestines have been bound down by adhesions, it is not always easy to say whether pregnancy or ovarian tumor exists. For unlike what is the true character, if the tumor is situated in the ligament, tube, or ovary. As long as it remains in the pelvis, it is often impossible to make a diagnosis, unless some of the fluid is obtained for examination by aspirating through the vagina; and this may be done if any urgent reasons are apparent. In extra-uterine pregnancy, the uterus is always found enlarged, and the cervix soft, while often symptoms of pregnancy will also exist, and more or less constant bloody uterine discharge. In these cases the uterus is generally displaced somewhat laterally, and the mass occupies a lower position at the side of the vagina, and is in closer relation with the uterus itself, than an ovarian cyst ever is, or a tubal dropsy, or a cyst of the broad ligament at so early a stage of development. Moreover, a difference exists in the shape of these several growths, which can be recognized by a digital examination per rectum. The ovarian cyst is almost always round and uniform in shape; a cyst of the tube is irregular, as if twisted upon itself, and generally largest at the ovarian end; and in tubal pregnancy the sac can be felt spreading out laterally away from the uterus, and ballottement can be frequently gotten, between the second and third month. Or by letting the finger rest under the sac, quietly in the rectum, an impulse can be felt transmitted from palpation over the abdominal walls, conveying the impression that a somewhat solid body impinges on the finger, and lies free in the fluid. The ovarian cyst should not be mistaken for hematocele, for if the history should give no indication of the condition, the finger will readily recognize that the cul-de-sac is filled as it would be by a fluid settling into it. But quite a different impression will be given with a cyst distended by fluid, which preserves its own special outline, while it merely rests in this locality.

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A cyst of the broad ligament, if greatly enlarged, might be readily mistaken for a unilocular ovarian cyst, but an examination of the fluid, as of the fluid of peritoneal dropsy, will show it to be very different from that found in an ovarian tumor. The same may be stated in regard to a dermoid cyst, for its contents bear no resemblance to those of an ovarian tumor; moreover, a tumor of this kind rarely if ever reaches a size equal to that attained by an ovarian growth in its latter stages of development.

There are many other conditions which have been mistaken for ovarian tumor, but the subject is too extended a one to be treated of here at greater length, especially, since I hold that such mistakes will not now be committed by any one who has had experience sufficient to warrant his operating. The student may with much profit consult Dr. Peaslee's valuable work, in which the differential diagnosis is treated of in a most exhaustive manner. It contains also a description of renal cysts, cystic growths of the liver and omentum, and other rare conditions sometimes mistaken for ovarian tumors, but so seldom met with as to justify their exclusion from this work in favor of more practical matter.

A fibro-cystic tumor of the uterus is the only growth which, after a thorough examination, could ever be mistaken for an ovarian tumor, and it is even held that this may be diagnosed by an examination of the contained fluid. This is true in many cases, but there are exceptions where it is impossible to decide until after an exploratory incision through the abdominal walls. Moreover, I have myself had several cases, in which both an ovarian and uterine fibro-cysts existed in the same individual. This subject will be again referred to when treating of the differential diagnosis between the two conditions.

No examination should ever be deemed completed without an exploration by the rectum. The following unique case illustrates the importance of this, the record showing that without a rectal examination, it would have been impossible to determine that an ovarian tumor did not exist.

CASE LVIII.—Nov. 17, 1870, an unmarried woman, a native of the United States, aged 36, was admitted to the Woman's Hospital, with a supposed ovarian tumor. She stated that ten years previous to admittance, she detected a swelling as large as a goose egg, in the right iliac region, her attention having been drawn to it by shooting pains through the abdomen, and starting from this point. She began to suffer from obstinate constipation, from which she could never obtain entire relief. Otherwise, she had experienced little inconvenience, except from a feeling of distension and occasional pain, while the size of the tumor increased very slowly. Once when the abdomen was greatly distended, retention of urine took place for some hours, and the catheter had to be used, but this did not occur again. She had been suffering for some time with pain in the back and over the sacrum, which was increased by walking, and would extend to the thigh after any exercise. The right leg and sometimes both feet were œdematous. The patient on admission presented a very cachectic appearance, and was very much emaciated.

The abdomen was found uniformly enlarged and tympanitic over its whole surface. No solid mass could be detected by palpation, except a slight prominence in the right iliac region, which was thought to be the fundus of the uterus. On making a vaginal examination, the cervix uteri could be scarcely reached, situated as it was above the pubis, while a mass was felt behind in the cul-de-sac, extending to the right, apparently an ovarian cyst. But from a digital examination in the rectum, it was made evident that the rectum was pushed forward by a large, soft, fluctuating tumor behind it, which filled up the hollow of the sacrum to within a short distance of the anus. It was firmly adherent to the sacral prominence. . . . .

December 2. The patient was placed under ether, and a fine trocar was introduced into the sac, about three inches beyond the anus, by which an ounce or more of its contents was aspirated by Dieulafoy's pump. This fluid was serous in character, perfectly clear and limpid, resembling hysterical urine. It contained no albumen, and the microscope revealed nothing more than a few oil globules, which had beyond question been attached to the instrument before its introduction. She never recovered from the effects of the ether, and had a chill twenty-three hours after puncturing the cyst; the action of the kidneys was at one time nearly suspended; she lingered for several days in a partial stupor, and ultimately died from uræmic poisoning.

Autopsy, nine and a half hours after death. On opening the abdomen, the colon was so much distended as to fill the whole cavity, and reached to a level with the fourth rib, being filled with flatus and feces. The upper border of the uterus was two inches below the umbilicus, and to the right side. The bladder, in its position in front of the uterus, covered it except a small portion of the fundus. A cyst, which contained some three quarts of fluid, was found behind and to the right of the rectum, filling completely the cavity of the pelvis, and extended up to a line with the second lumbar vertebra. The left ovary and broad ligament were spread out over the surface of the rectum; both ureters in front of the tumor, the left being much dilated. The rectum was greatly constricted in its upper portion. The liver was covered by the colon. There was chronic cystitis. The kidneys were found diseased, but unfortunately my notes of the case do not state the extent. In attempting to discover the attachments of the cyst in the hollow of the sacrum it was ruptured. The sacrum was removed, and a spina bifida found, the three lower bones of the sacrum being deficient on the right side. A funnel-shaped opening communicated directly with the spinal canal, from which projected portions of the cauda equina an inch or more in length. After carefully examining this opening I was satisfied that the cyst had been cut away from its margin. Although the posterior portions of the bones were wanting, no external bulging of the sac could take place posteriorly in consequence of the dense ligamentous structure bridging it over. Over the posterior surface of the sac, and to the right side, a network of nerves from the spinal canal extended some distance, and became gradually lost.

The sacrum was dried and prepared by removing the ligamentous tissue, which stretched across the posterior wall, where the bony structure was wanting, but the anterior surface was left entire. On examining the preparation by transmitted light, a network of large nerve filaments, similar to those on the sac, could be seen passing down directly from the canal and spread out over the whole surface. These were under a thin membrane, which was doubtless a continuation of that forming the posterior wall of the spinal canal. Where the sac had been removed, these nerves could be seen but little diminished in size, and were included in the division on the right side, throughout the whole extent. The boundary of the canal, at the point where the sac had been removed, as indicated by the rough edge, was oval in shape. It extended from the upper margin of the second sacral foramen on the right, to the position of the coccyx, and from the edges of the foramina of the third and fourth bones on the left side, to what would have been the width of the sacrum had the bone been fully developed. The edges of the sacral bone above, and of those on the left side, were gradually rounded off so as to form the funnel-shaped passage already described as leading into the spinal canal. There was a deficiency of the lower spinal process, and there was no trace of the coccyx. The case can be scarcely called one of true spina bifida. It is probable that the bone between the second and third sacral foramina was not developed, and an opening was left large enough for a sac to protrude, and the deficiency afterwards found may have resulted from absorption, as the sac gradually increased in size.

I have been unable to find any case on record where a deficiency existed in the anterior part of the spinal column. This case presented a feature of tolerance to pressure of the cord which does not exist in other cases of spina bifida except in rare instances, and then only to a limited extent. Its origin being, of course, congenital, the duration of life in this case was also a remarkable feature, and while the age was given as but 35, the patient presented the appearance of being fully ten years older.

(This case is chiefly of interest to the pathologist, and strictly does not belong to the subject under consideration, but I point to its unique character, and the

fact of its illustrating how important for differential diagnosis is the examination per rectum, as my apology for introducing it here. It was presented and discussed at a meeting of the New York Obstetrical Society, Jan. 3, 1871, and published in the American Journal of Obstetrics, Feb. 1871. A fair although too small a representation of the appearance of the sacrum is also given in the Journal. I intended to have a large drawing made of this bone, but unfortunately, without my sanction, it passed into the hands of some unknown person, who possibly desired to study at greater length its unique peculiarities. I am ignorant of its whereabouts, but hope, if this should reach the eye of the present possessor, he may be prompted to return it.)

Differential Diagnosis between certain Fibrous Growths, and Fibro-cysts of the Uterus and Ovarian Tumors.—When the uterus has become very much enlarged from the growth of a fibrous tumor, a certain gelatinous consistency can often be detected, which is very deceptive in giving the impression of fluctuation. But, as a rule, the uterus will not be found uniformly enlarged, and certain hard outgrowths will be detected, feeling much like fibrous nodules. The history will often furnish the best basis for forming a diagnosis. The growth will have been recognized for a number of years. A tendency to uterine hemorrhage, either during the menstrual nisus, or coming on in the interval, may have been observed. This symptom, however, cannot be relied upon alone, since bleeding may occur with an ovarian cyst, and is not always attendant upon fibrous tumor, unless the mucous membrane of the canal is encroached upon. The uterine canal will generally be found deeper than natural, and this should be received as suggestive of fibrous tumor. The action of the kidneys is never obstructed by fibrous growths, as we have seen is always the case in the advanced stages of a rapidly developing ovarian tumor. The peculiar expression of the face, so characteristic of ovarian tumor, is never found with fibrous growth, nor is there the same loss of flesh, but general emaciation, from hectic, accompanies its last stages.

When a fibrous tumor becomes pedunculated, as sometimes occurs, it is often difficult at first to distinguish it from a partially developed ovarian tumor. Time, however, will make the difference clear, long before the growth can reach a size calling for surgical interference.

Fibro-cystic tumors of the uterus are among the most important in their diagnostic relation to ovarian tumors. It has been but a few years since these growths were first recognized, and pointed out by Cruveilhier. In 1871, as shown by Dr. Charles C. Lee,[1] now surgeon to the Woman's Hospital, there were nineteen cases on record, where an attempt had been made to remove these growths, through mistaken diagnosis of ovarian tumors; nine occurred in this country, and ten abroad. Only a small proportion of such mistakes, I believe, are ever published. To this day we do not possess any perfectly reliable means for determining the condition under all circumstances, and our most trustworthy guides are a highly educated touch, and well-trained powers of observation. I have, in former years, seen an unusual number of fibro-cystic tumors of the uterus, from my being so long in charge of the Woman's Hospital, where these cases were often sent when the physician met with difficulty in forming a diagnosis. But now, from a more widespread knowledge of these growths, I see comparatively few cases, yet I have no doubt that they are far more common in this country than abroad. The errors which sometimes arise in differentiating between ovarian tumor and fibro-cyst of the uterus are forcibly illustrated by Case XXXII., page 567.

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[1] New York Medical Journal, Nov. 1871.

Dr. Peaslee also records in his book a case in which both he and I made the diagnosis of an ovarian tumor, which proved at the operation to be a single fibro-cyst growing from the fundus of the uterus. It was, however, removed with but little difficulty, and the woman recovered. My errors of diagnosis in this line are summed up in these two cases.

It is well to pass in review all the symptoms which have been presented as connected with fibrous tumors, because sometimes they accompany these growths before they develop a cystic character. In doubtful cases heretofore it has been regarded as good practice to make an explorative incision to determine the character of the tumor. When the parts are found sufficiently free from adhesions so that the cyst-wall can be exposed, the true character of the tumor can generally be recognized at a glance. Nothing is more characteristic than the dark and congested appearance of a fibro-cystic tumor of the uterus, so strongly in contrast with the light, clear, pearl-like hue of most ovarian cysts. This appearance, however, may be misleading, since, in some multilocular cysts of the ovary, when the several cysts are small and the fluid dense, the tumor is essentially a solid one, and when its circulation is obstructed it may resemble in color a uterine fibro-cyst. With our present knowledge there are no better means of diagnosis, in obscure cases, than the examination of the fluid contents of the growths, although even this test is often inconclusive.

CHAPTER XXXIX.

ABDOMINAL TUMORS.

Contents of abdominal tumors and ascitic fluid considered in relation to diagnosis.

According to Waldeyer,[1] Eichwald found the contents of ovarian cysts to contain in solution chiefly two series of organic substances, designated by him as belonging to the mucin and albumen series. In the mucin series he classifies mucin, colloid matter, and mucin-peptone. In the albumen series, albumen, paralbumen, metalbumen, and albumen-peptone.

The occurrence of paralbumen and metalbumen is of special importance in discriminating between ovarian and ascitic fluid. The first especially is never absent, in Waldeyer's experience, from ovarian cystomata; and the contents of the Graafian follicles are an almost pure solution of paralbumen. The sediment of the cystic contents consists, according to him, of the detritus of cells of different size and form, large fatty granules, distended cells, in a state of paralbuminous, mucous, and colloid degeneration, with many well-preserved cylindrical cells. In addition, frequently cholesterine crystals, blood corpuscles, pigment scales, and pigment granules are found.

M. Koeberlé stated,[2] at the meeting of the Medical Society of Strasburg, Nov. 15, 1875, that the fluid of ovarian cysts contains some albumen, but more of the variety called paralbumen, the precipitate from which, formed by nitric acid, was soluble in acetic acid. As no paralbumen, but albumen, was contained in the fluid from a cyst of the Fallopian tube, the precipitate formed by nitric acid was increased by acetic acid. The contents of a cyst of the broad ligament contain salines, and seldom albumen, but when present the precipitate formed by nitric acid becomes soluble in an excess of the same acid.

Mr. J. K. Thornton, of London, read a paper April 20, 1876, before the Harveian Society,[3] on the use of the microscope in diagnosis of ovarian tumors, and in connection with the subject, made reference to the chemical examination. He stated that he placed the greatest reliance on the presence of paralbumen, which is soluble in strong boiling acetic acid. When the fluid was from an ovarian cyst, a coagulum formed on heating, which was either entirely dissolved, or became a transparent jelly on adding an equal portion of strong nitric acid, and continuing the application of heat. If, however, the coagulum became only partially dissolved or gelatinized, when boiled with an excess of strong acetic acid, the fluid was in all probability a mixture of both ovarian and ascitic fluid. But in doubtful cases, as an indication of ovarian fluid, he placed much value on the presence of the ovarian granule of Drysdale, which will be referred to hereafter.

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[1] Archiv für Gynækol.

[2] The Obstetrical Journal of Great Britain and Ireland, April, 1877.

[3] Medical Times and Gazette.

The late Dr. Atlee attached much diagnostic importance to the examination of fluids taken from abdominal tumors. To his work[1] I would refer the reader for more extended details than can be given here. In regard to the diagnosis of one condition, which has been generally found by others most difficult, his experience enables him to express very positive views, viz., "In reviewing the foregoing cases of fibro-cystic tumors, it must be apparent that I regard paracentesis as the only reliable means in certain cases to be adopted, in order to make out a positive diagnosis between these tumors and ovarian cysts. I consider the fluid removed from the fibro-cystic uterine tumor to be blood, *minus* the corpuscles, or true liquor sanguinis which rapidly coagulates on exposure to the atmosphere, and after a reasonable time separates into fibrin and serum. So far as my experience goes, I have met with no other fluid removed from the abdominal cavity that undergoes such changes, nor have I met with any other form of tumor that furnishes such a fluid. It may, therefore, be pronounced not only diagnostic but pathognomonic. It is true that fluids are removed from the general cavity of the abdomen, or from local cysts having an inflammatory origin, in which are formed fibrinoid substances. But the entire mass of these fluids does not coagulate on exposure to the air, and these fibrinoid formations usually require several hours for their production, and appear like strings suspended in a large quantity of fluid, and very different from the clot and serum above referred to. It is also in accordance with my experience that, when either of the above fluids is removed by tapping, we must exclude the idea that it comes from an ovarian cyst." Dr.

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[1] General and Differential Diagnosis of Ovarian Tumors, etc., by Washington L. Atlee, M.D., Phila. 1873.

T. M. Drysdale, of Philadelphia, having for many years been in the habit of examining the contents of abdominal tumors in the practice of Dr. W. L. Atlee, was the first to describe accurately a cell which he calls "the ovarian granular cell." This he claims can always be found, by the aid of a microscope, in the fluid contained in the ovarian cysts. Dr. Drysdale's views are fully given in Dr. Atlee's work, and his essay on the subject will be found in the Transactions of the American Medical Association. At a more recent date he has expressed his views in the following manner.[1] "It is not a fatty degenerated cell, as Dr. Engelman has just said, but a cell characteristic of ovarian fluid, and which I have called the ovarian corpuscle, or cell. It is an albuminoid body containing little fatty particles which give it a granular appearance. It resembles in some particulars many other granular cells, but can be distinguished from all other cells found in the abdominal cavity. I have examined over 1500 abdominal fluids, and can speak with regard to the matter positively and conscientiously. The principal test I employ is acetic acid. If the cell is ovarian, the acid changes it but little, perhaps renders it only a little more transparent. But if it is a white blood cell, a lymph corpuscle, or any of those granular cells which resemble them, it will nearly always take on a different appearance; the cell almost vanishing, perhaps, and multiple (2–5) nuclei appearing, as in the pus cell. Then if the cell is suspected to be the fatty degenerated or Gluge's cell, ether may be added, by which the fatty matters will be dissolved and disappear. If no fatty degeneration be present, it is sufficient to add acetic acid."

Dr. Drysdale can speak with more confidence than others. I believe the "ovarian corpuscle" has never been found in any other tumor, and when present may be accepted as pathognomonic. But unfortunately in certain cases, where the physical condition may leave the most expert observer in doubt as to the true character of the tumor, this corpuscle is sometimes not found by the microscope. In two instances of doubt, it has occurred to me to operate and remove ovarian tumors after experts were unable, from an examination of the fluid, to give me the slightest information in regard to the character of the tumor. We are certainly already greatly indebted to Dr. Drysdale, but I hope by further observation, he may yet be able to offer a test which can be relied upon under all circumstances.

It will rarely happen that an accumulation of fluid in the abdominal cavity can be mistaken for an ovarian tumor. But an ovarian tumor may exist with, and be hidden by ascites, the result of the peculiar character of the ovarian tumor, or it may be from some other accidental condition. The accidental causes of ascites may be from some disease of the heart, kidneys, or liver, having no connection with the ovarian tumor; and the tumor itself may, in consequence of its size, impede the circulation with the same effect as if the obstruction was in the portal system.

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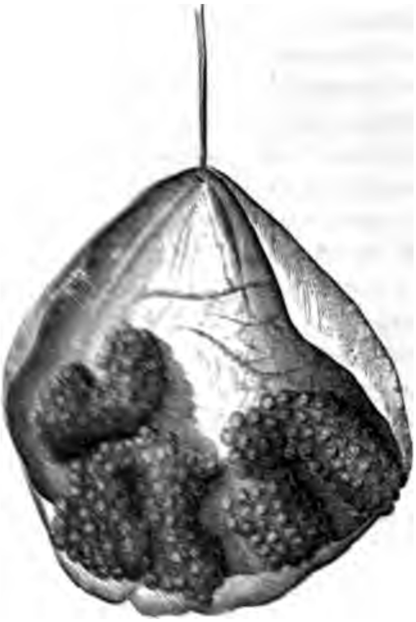
[1] Trans. Am. Gynecological Society, vol. i. 1877, p. 195.

Fig. 122.



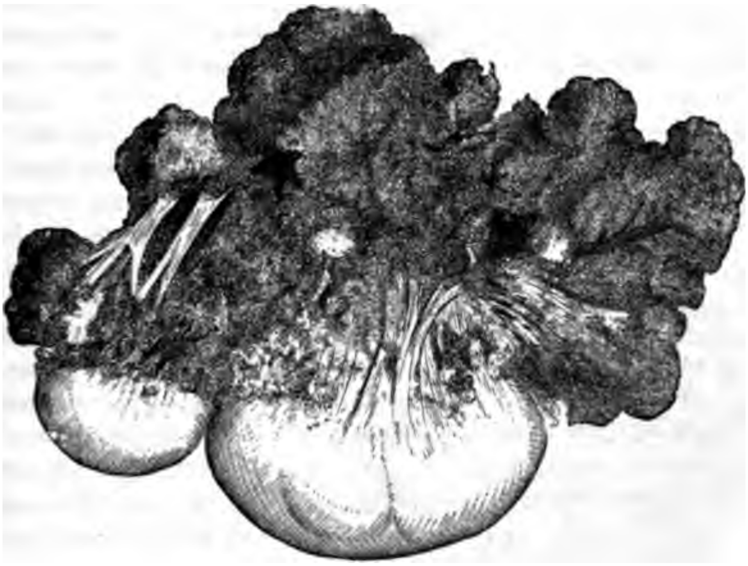
Papillary growths in a cyst.

A very important point in the differential diagnosis is to ascertain, by an examination of the fluid, if a certain papillary growth exist which has been referred to. This growth springs from the lining membrane of the smaller ovarian cysts, and, as shown in Fig. 122, begins as single papillæ, which afterwards coalesce. These develop rapidly, until at length the wall of the cyst ruptures, and then retracts, leaving a sprouting mass projecting far into the peritoneal cavity, as shown in Fig. 123.

These illustrations were taken from drawings of a tumor removed by me in 1871, and were made by Dr. James B. Hunter, at that time one of my assistants, but now a surgeon to the Woman's Hospital.

Either as a consequence of the presence of the mass itself, or from the irritation established by the escape of the fluid contained in these cysts, a low grade of peritonitis becomes established. This growth has been regarded as a form of malignant disease, and, for this and other reasons to be stated hereafter, it is urged that such a tumor should be removed as soon as its character is ascertained by an examination of the ascitic fluid. The few cases which have passed under my observation have nearly all recovered, as after the removal of any other form of ovarian tumor. The diagnosis in all was obscure until the ascitic fluid had been removed, so as to admit of the character of the mass being made out. I was not at that time familiar with the microscopic appearance to be described, but always recognized the condition by the presence of blood which increased in quantity as the pressure was lessened by the removal of the accumulated fluid from the abdominal cavity. With every case where this condition was suspected, preparations for the operation were made so as to complete the removal of the mass as soon as possible. I have never regarded the condition as malignant in character, or that it was in any respect more than a benign growth, accidental to ovarian tumors, and accompanied by an ascitic accumulation. I have, however, sometimes observed in this supposed malignant disease, that patients bore badly the shock of the operation, and died from apparently trivial causes. But this I have always attributed to the additional impairment of the system by the accumulation in the abdominal cavity.

Fig. 123.



Papillary projections after rupture of a cyst.

Two papers of great practical value, on "The Diagnosis of Malignant Tumors of the Ovary and Malignant Peritonitis," have appeared,[1] called forth by certain remarks made by Mr. Spencer Wells. These were made in his second lecture "On the Diagnosis and Surgical

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[1] The British Medical Journal, July 20, 1878, by James Foulis, M.D., Edinburgh; and September 7, 1878, by J. Knowsley Thornton, M.B., C.M.

Treatment of Abdominal Tumors," delivered June 12, 1878, in the Royal College of Surgeons of England, and were as follows: "Mr. Knowsley Thornton made a great addition to our knowledge, in pointing out that, in addition to these cells of Drysdale, which are common only in simple or innocent ovarian tumors, in malignant tumors you have these very characteristic groups of cells of different sizes. He describes them as large numbers of characteristic groups of large pear-shaped, round, or oval cells, containing a granular material with one or several large clear nuclei, with nucleoli, and a number of transparent globules or vacuoles. The cells composing the groups are many of them very large, but the great variety in size and shape is the marked feature of the group. If you will bear these different forms in mind, and these different cells, I believe you will find that they are characteristic and of great value in the examination of these fluids, putting us on our guard when we have to deal with tumors, doubtfully malignant. If these large groups of cells be seen, one may be pretty certain the tumor is malignant of some kind; or if they be found in fluid removed from the peritoneal cavity, probably a sort of infecting process has been going on in the peritoneum; from rupture of an ovarian cyst of a malignant character, these cells may have planted themselves upon some part of the peritoneum and multiplied."

Dr. Foulis took exception to the credit thus given Mr. Thornton, and claimed priority. Mr. Thornton in turn justified Mr. Wells's statement, saying that the latter had been familiar with his views before Dr. Foulis had first placed his on record. It is made evident, however, from these statements, that equal credit is due to each, since each began his investigations within a few days of the other, and in ignorance of the fact. Dr. Foulis states: "If the microscopic examination of the deposit in the ascitic fluid discovers numerous masses of sprouting epithelium, malignant peritonitis may be certainly diagnosed. The forms of these sprouting masses of cells are extremely various. Many of the larger masses may be detected with the naked eye; the microscope, however, is necessary to bring most of them in view. But whatever their form, the fact remains that they are found in great numbers in ascitic fluid surrounding malignant ovarian tumors, and if they are found in large number in *bloody ascitic fluid*, we may safely conclude that one or many villous or papillomatous growths are on the peritoneal surface." "The finding of ovarian granule cells and a few specimens of small masses of proliferating cells in ascitic fluid should not necessarily prevent the attempt to remove the ovarian tumor, because, as the result of experience, we have found that patients may remain perfectly well from whom such burst tumors have been removed; but where you find in the ascitic fluid a great number of large sprouting masses of cells, many of which are visible to the naked eye, it may be safely concluded that the peritoneum is seriously infected, and probably the ovarian tumor has formed such adhesions with neighboring parts as will prevent its entire removal." "The finding of sprouting masses of epithelium within the ovarian cysts is not of much practical value, as such tumors are often removed without risk of future peritoneal affection."

Mr. Thornton writes: "I believe these groups to be of two kinds: the one consisting of masses of germinating endothelium, the other of masses of germinating or proliferating cells, derived not from the endothelium, but from the ground substance of the peritoneum. Various forms will be seen, some looking like mere clusters of lymph-corpuscles (like bunches of grapes), others like more or less flattened endothelial plates arranged in layers, and others presenting every variety of size and shape, and every stage of growth. It is these latter to which I attach the most importance as indicating malignant disease, and under this term I include both the rapidly growing sarcomata and carcinomata, and certain peculiar ovarian papilloma. I have great hopes that careful study will enable us to diagnosticate by these groups not only the presence of malignant, as differing from simple tumors, but also the special forms of tumor. I would say here that I believe the presence of any large collection of ascitic fluid around an abdominal tumor is always suggestive of malignancy, but whether its presence is merely due to irritation of the peritoneum by rapid growth, or to some more direct infection, I think is at present uncertain." "These seem to grow slowly, and so long as they are confined to the cyst cavity appear quite harmless, but cysts containing them are very prone to rupture, the first result of such rupture being a troublesome ascites from constant effusion into the peritoneum of ovarian fluid, and its consequences already mentioned; and when once they grow free in the peritoneal cavity, they assume a clinically malignant aspect, partly from the readiness with which they contract adhesions, rendering the removal of the tumor difficult or impossible, but more especially by an actual spreading of the growths over the peritoneum, the proliferating cells rubbed off in the movements of the patient either taking fresh root, or, as my observation leads me to think, causing fresh growths at points where they settle by a process of auto-inoculation." "I do not often examine the lining membranes of the cysts now, but I have examined quite enough to make me certain that the form of papilloma which gives rise to infection is comparatively rare, and when it is found, it is commonly found in every cyst in the tumor, and often fungating through from one cyst to another, or to the external surface." "I still maintain that the finding of the cell-groups in the cyst-fluid is the all-important point, as, by prompt operation and care in performing it, we may hope to prevent infection, adhesions, or peritonitis. And I have seen more than one case giving thoroughly convincing proof of the 'practical value' of the discovery of these cell-groups while still confined to the cyst, and of the danger of neglecting to act on the warning given by their discovery. Dr. Foulis still attaches importance to the bloody or port wine color of the ascitic fluid. I have for some time ceased to do so, as, at successive tappings of the same cases, I have found the peritoneal fluid of a port wine color, and then of a perfectly clear straw color; and the latter has contained just as many rankly growing cell-groups as the former." "Reading over the cases operated on by Mr. Wells, Dr. Keith, and Dr. Atlee, would not lead me to agree with Dr. Foulis as to 'so-called ovarian cancer' being common, nor would my own experience, now extending to six or seven hundred cases of abdominal tumor. I think, considering the number of ovariotomies performed and published by the leading operators, cancerous or malignant tumors of the ovary are remarkably rare, and the cases of recurrence after operation still more so. Compare the ovary and breast in this respect."

I scarcely feel that an apology is due for presenting the views of these two observers at such length. The subject is one of sufficient importance to justify the attention which has been given it, and from no other source could any information of more practical value be obtained.

In this connection Dr. Keith's views, as recently expressed,[1] are of great interest. "One's pleasure in this operation is, however, greatly marred by the frequency with which malignant disease is found at the operation, or reappears soon after it, upsetting all one's calculations. In one-fourth of my deaths, the tumors were malignant, and with very few exceptions, in those who have died since their return home after ovariotomy, some cancerous affection has been the cause of death. Thus, amongst these, five young and healthy looking women have left me, all after severe operations, the pictures of health and happiness, and have died within a short time of peritoneal cancer."

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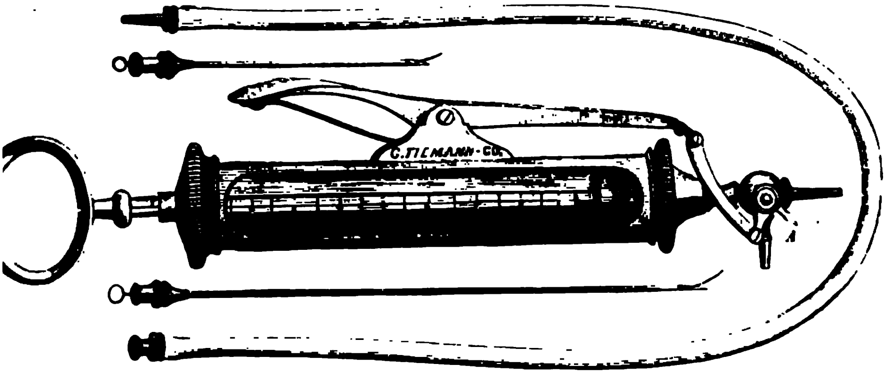
[1] Results of Ovariotomy before and after Antiseptics, by T. Keith, F.R.C.S., Edinburgh. British Medical Journal, Oct. 19, 1878.

This is certainly a remarkable experience, and confirms the statement which has been advanced, that cancerous affections are far more common in old settled countries than in our own. In the United States, cancer of the ovary, in any form, is certainly a very rare lesion. During the past eighteen or twenty years I have operated for, or have witnessed the removal of at least one hundred ovarian tumors, and I have never seen a case of cancer in connection with one, and of papilloma I have seen only five instances. Moreover, I have never known an instance where cancer has appeared at any time after the operation, but on the contrary, having recovered, the women have then entered on a new lease of life.

To obtain the fluid for examination from an abdominal tumor by means of any trocar which would be large enough for the flow to take place through it, under the ordinary pressure of the atmosphere, would often be attended by serious consequences. Several fatal cases have been reported where death had resulted from the use of the ordinary exploring trocar. Dr. H. F. Walker, of New York, suggested and first used, in 1870, the hypodermic syringe for this purpose. There is still, however, danger attached even to so small a puncture, for I have had the sac become inflamed after employing the instrument; yet its use was a most important conception. The small size of the hypodermic syringe enables us to obtain only a very small quantity at a time, and necessitates its being detached a number of times, and thus causes much inconvenience, and sometimes an unde-

Fig. 124.



Emmet's aspirator.

sirable amount of irritation. At one time I applied Dieulafoy's principle to a syringe made for me by Mr. Stohlman, to which was attached the stopcock of a stomach pump (Fig. 124). By this arrangement the syringe could be emptied when required, and the exhaust again made without removing it. At Dr. Walker's suggestion the canula was made as small in diameter as that of a hypodermic syringe, and this made an admirable instrument. Yet, notwithstanding the evident advantage of the reduction in size of the canula, already six deaths have been reported as following the use of the aspirator in tapping ovarian cysts.[1]

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[1] Report of the Progress of Gynæcology during the year 1875, by Paul F. Mundé, M.D., Am. Journ. Obstet. April, 1876; and Vaginal Ovariotomy, by Dr. Wm. Goodell, Trans. Am. Gyn. Soc., vol. ii. p. 277.

CHAPTER XL.

TREATMENT OF OVARIAN CYSTIC TUMORS.

Internal remedies—Surgical treatment; tapping; injection of iodine; drainage; vaginal ovariotomy; abdominal ovariotomy.

We need consider only briefly the treatment of ovarian tumors by internal remedies. Formerly a number of drugs were more or less noted for their supposed efficacy, but they have all been proved to be valueless. The inference is, that in cases where they were supposed to be serviceable, there was an error in diagnosis, and as their virtues were held to be due to their action on the kidneys, it becomes very probable that ascites was often mistaken for ovarian tumor. By increasing the action of the skin, kidneys, and bowels, some patients may, perhaps, be temporarily relieved of their discomfort, but it is well established that no remedy, internally administered, can produce the slightest change in the contents of an ovarian tumor.

The various surgical measures may be classed as follows:—

Tapping.
Injection of iodine.
Drainage.
Removal of tumor through the vagina or by abdominal incision.

Tapping should be regarded as palliative only, and should never be resorted to except for making a diagnosis, or to gain time when the condition of the patient does not yet admit of an operation. It is only applicable to single cysts, and should never be employed in the multilocular variety. Under the most favorable circumstances, according to Dr. Peaslee, one death in every twenty-five or thirty cases occurs from the first tapping. The chief dangers arise from peritonitis, which may be excited by the escape of some of the contents of the cyst into the peritoneal cavity, or from blood poisoning, the result of inflammation of the lining membrane of the sac. There is also a certain risk from hemorrhage if the omentum, which is often adherent to the front of the tumor and lower than usual, is wounded; and it is is left, reaching to the bottom of the sac. The cyst is washed out through the catheter, and the iodine injected by means of a glass syringe, the nozzle of which exactly fits the mouth of the catheter. This arrangement, however, is very imperfect in comparison with Thomas's trocar.

When adhesions exist the walls of the cyst will not be brought in contact, nor can the size of the cavity be materially diminished. It cannot be determined beforehand whether there are any adhesions, but if some are found no evil consequences are likely to follow the injection of the iodine, for, as a rule, this produces less disturbance than a single tapping.

Mr. Wells has recently advocated the following practice: "So I think we may lay down, as almost a positive rule, that, when we can be sure that the cyst is a single cyst, and we cannot discover any secondary growths in the cyst wall by examination by either the abdomen or the vagina, we must consider it a duty to see what tapping will do for a patient before adopting more serious measures. I think I have seen quite enough now to warrant me to endeavor to impress upon surgeons that if the cyst be a single cyst, before they do anything else, they should see what can be gained by one tapping. If the tapping be done with precaution, the risk is extremely small; the patient goes on living and may be cured." This is contrary to what has been heretofore advocated, but as it is advocated by a careful operator who has had a greater experience than any other [illegible], its correctness can now be scarcely questioned.

[illegible] that whenever such a cyst is tapped, [illegible] iodine injected into it, in order to lessen the [illegible]

[illegible] common that the injection of iodine is [illegible] when thrown into a multilocular [illegible] this, and yet the result in the [illegible] in this respect, as in many others, be [illegible] general rule.

[illegible] was admitted to the Woman's Hospital [illegible]. She had given birth to two children, and [illegible] several times. [illegible] eighteen months before admission she first noticed a [illegible] mass on the right side. She became pregnant shortly [illegible], and at the third month consulted a physician who proposed [illegible] notwithstanding her pregnancy. My opinion was asked, and [illegible] that she should go to full term.

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[1] British Medical Journal, June 29, 1878.

should stand behind the patient and carefully steady her body as she is rolled over to empty the cyst. The operator should seize the relaxed tissues about the trocar, between his thumb and second finger, and at an inch or more beyond the point of puncture. This is done to prevent the contents of the cyst from escaping into the abdominal cavity. The patient is to be then turned on the back, and the trocar removed while the tissues are still grasped. The exit of the instrument can be aided by placing the nail of the index finger, which is disengaged, against the skin at the edge of the puncture. A small piece of adhesive plaster should be placed over the puncture, and as the relaxed walls are held together, by pressure made on each side with the flat of the hand, two broad strips of plaster should be applied from under the flank, obliquely across the abdomen, to the neighborhood of the false ribs on the opposite side. Unless it be determined to inject the cyst, the use of Dieulafoy's aspirator is far preferable for making the first evacuation. The advantage of this instrument is that it affords greater immunity from evil consequences if a large viscus or bloodvessel be injured, and also entails less danger from peritonitis and inflammation of the sac. When the contents of an ovarian tumor are too dense to pass through the largest canula of the aspirator, and this is rare, the case will seldom prove a good one for tapping. We must not suppose the tumor to be a solid one, should no fluid escape, for it is immediately shown not to be solid if the canula can be moved freely in every direction.

While the tumor is yet very small, and probably formed by a single cyst lying in Douglas's cul-de-sac, the practice of tapping through the posterior cul-de-sac of the vagina has been advocated.

Dr. Noeggerath[1] has treated a number of cases, in which the cysts were small, by puncturing them from the vagina with the hypodermic syringe as a trocar, and has been so well satisfied with this operation that he says he has never found it necessary to remove these cysts by vaginal ovariotomy, an operation to be described hereafter. It is held that while these cysts are so small, the fluid contained in them is of so bland a character as to be unirritating to the peritoneum, and if it continues to escape through the puncture, success will be the more probable, as has been stated, when the cyst is thus kept collapsed. With other cases, as soon as the cyst can be recognized and at the earliest stage of development, while its walls are thin and the fluid unirritating, Dr. Noeggerath ruptures the cyst by pressure between a finger in the vagina and the hand upon the abdominal wall, under the hope that it may not refill.

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[1] Transactions of the Am. Gynæcological Soc., vol. iii. p. 275.

I have never ruptured such a cyst, yet if the diagnosis can be made out early enough, I do not believe that any serious consequences would arise. But I have punctured several somewhat larger cysts with a trocar from the vagina, and in every instance more or less cellulitis has resulted. This might have destroyed the cysts, but I am unable to determine that, for the cases all passed from under my observation. Yet should one of these cysts fill again and continue to develop, it would be most probable that pelvic adhesions, as a result of the attempted cure by rupture, would be encountered in any attempt to remove the tumor.

Injection of Iodine into Ovarian Cysts.—Dr. Alison, of Indiana, according to Dr. Peaslee, was the first to place on record (1846) the history of a case cured by injections of iodine, but to Boinet is due the credit for establishing the practice as a suitable one under certain circumstances.

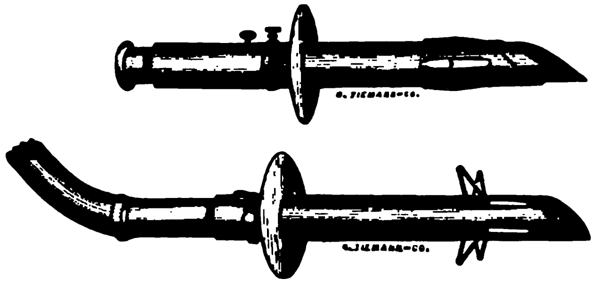
It is only applicable in just such cases as we have pointed out as proper for tapping. When the cyst is large and the tumor practically unilocular, and free from adhesions, the careful injection of iodine into it will sometimes be followed by good results. The iodine is not injected for the purpose of producing adhesive inflammation of the cyst wall, for this would lead to suppuration and blood poisoning. Its effect is in some way to arrest the secretion of the cystic fluid, and to change the character of the lining membrane, after which the sac shrivels away from being kept no longer distended. When iodine is injected into a pyogenic sac, after the pus has been evacuated, it acts beneficially by changing the character of the lining membrane.

Before injecting the iodine, the cyst should be tapped with rather a large size trocar, of sufficient length to insure the instrument against slipping out of the sac as it becomes emptied. One devised by Dr. T. G. Thomas answers admirably for the purpose, as it can be fixed within the sac by projecting out, like the ribs of an umbrella, a number of small arms, or spurs, near the end of the canula (Fig. 125). A great advantage of the instrument is that it enables the walls of the cyst at the puncture to be held in close contact with the abdominal wall, so that there can be no escape of fluid into the peritoneal cavity.

After the cyst has been emptied, a sufficient quantity of warm water should be injected to wash off any ovarian fluid that may be adherent to the lining membrane. This is done by attaching to the canula a short piece of tubing connecting with a Davidson's syringe.

The water is withdrawn by reversing the syringe. It is of the greatest importance to exclude air from the cyst, a small quantity being sufficient to cause inflammation of the lining membrane of the sac, and its consequences. The operation, therefore, should be done under carbolic acid or some other antiseptic spray. Before the antiseptic method was in vogue, I was in the habit of applying a clamp to the rubber tubing to prevent the entrance of air.

Fig. 125.



Thomas's trocar.

The syringe is to be filled with the undiluted tincture of iodine, U. S. P., and thrown directly into the cavity of the cyst. After detaching the syringe, the patient must be turned slowly from side to side and placed in the upright position for a few moments, so that the iodine may be brought in contact with as large an extent of surface of the sac as possible, and the more effectually this is done, the greater will be the success obtained.

As it might prove a source of irritation, and even excite peritonitis, should any quantity of the iodine escape into the abdominal cavity, it must be carefully withdrawn from the cyst. This can be readily done by turning the patient somewhat over on the face, as she lies on the edge of the bed, so as to bring the puncture to the most dependent part of the body.

If the canula has no vents, or slots near its extremity to give exit to all of the fluid, it will be necessary by skillful manipulation to depress its inner end until brought in contact with the cyst wall; when, if it is properly done, not only will all the iodine come away, but with it any air which may have accidentally entered, and the walls of the collapsed cyst will fall closely together.

In the usual method of tapping, when the cyst is to be injected, a long canula of sufficient diameter to pass a large size flexible male catheter is employed, and when the canula is withdrawn, the catheter is left, reaching to the bottom of the sac. The cyst is washed out through the catheter, and the iodine injected by means of a glass syringe, the nozzle of which exactly fits the mouth of the catheter. This arrangement, however, is very imperfect in comparison with Thomas's trocar.

When adhesions exist the walls of the cyst will not be brought in contact, nor can the size of the cavity be materially diminished. It cannot be determined beforehand whether there are any adhesions, but if some are found no evil consequences are likely to follow the injection of the iodine, for, as a rule, this produces less disturbance than a simple tapping.

Mr. Wells has recently advocated[1] the following practice: "So I think we may lay down, as almost a positive rule, that, when we can be sure that the cyst is a single cyst, and we cannot discover any secondary growths in the cyst wall by examination by either the abdomen or the vagina, we must consider it a duty to see what tapping will do for a patient before adopting more serious measures. I think I have seen quite enough now to warrant me to endeavor to impress upon surgeons that, if the cyst be a single cyst, before they do anything else, they should see what can be gained by one tapping. If the tapping be done with precaution, the risk is extremely small; the patient loses nothing, and may be cured." This is contrary to what has been heretofore accepted, but as it is advocated by a careful observer, one who has had a greater experience than any other operator, its propriety can now be scarcely questioned.

I would, however, recommend that, whenever such a cyst is tapped, it be washed out and iodine injected into it, in order to lessen the probability of its refilling.

All authorities agree in the opinion that the injection of iodine is of no benefit, but is often hurtful, when thrown into a multilocular tumor. My experience fully confirms this, and yet the result in the following remarkable case may, in this respect, as in many others, be cited as an exception to the general rule.

CASE LIX.—Mrs. Kate D., aged 28, was admitted to the Woman's Hospital Dec. 1, 1874. She had given birth to two children, and had miscarried several times. About eighteen months before admission, she first noticed a movable mass on the right side. She became pregnant shortly afterwards, and at the third month consulted a physician who proposed to operate notwithstanding her pregnancy. My opinion was asked, and I urged that she should go to full term.

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[1] British Medical Journal, June 29, 1878.

and have the operation afterwards if needed. My advice was followed, and as the pregnancy advanced, the tumor was crowded up and over to the left side, but without apparently increasing in size. In fact, it seemed to become smaller after an attack of vomiting, shortly before delivery, when she threw up a large quantity of dark coffee-colored fluid. At my request she was attended by Dr. George T. Harrison; the labor was a natural one, and afterwards the tumor dropped back again to the right side. Her general health was good, and she was able to nurse her child, but the growth of the tumor increased so rapidly, and she suffered so much irritation of the stomach, that Dr. Harrison was obliged to tap her. This afforded great relief, and had the effect of greatly reducing the size of the mass.

At the date of her admission she was suffering chiefly from dyspepsia and irritability of the stomach.

On examination a globular tumor was found with the abdominal wall drawn apparently tense over it. Fluctuation was very obscure, and percussion gave dulness over all of the abdomen, except just above and to the left of the umbilicus. This resonant portion was supposed to correspond to the transverse colon, which it was even thought could be seen through the unusually thin abdominal wall. From the vagina no portion of the tumor could be felt, while the uterus was found of normal size and retroverted, but movable.

Dec. 3d. I began the operation in the presence of Drs. Peaslee, T. G. Thomas, George Harrison, Bache Emmet, and others of the Hospital Staff.

The first incision was some five inches in length, and was carried down carefully to the tumor, when a portion of what was supposed to be an adherent intestine presented itself. Two fingers were passed at the upper angle between the parietes and tumor, from which point the abdomen was laid open with a pair of scissors nearly to the ensiform cartilage, the tissues being divided between the fingers as they were advanced for protection. The incision was also extended to the pubes. No adhesion existed to the abdominal wall, but when the flaps were turned back, a condition was discovered unique, and, I may add, startling on account of the difficulties presented. The stomach, colon, and omentum were all adherent to the surface of the tumor and below the line of the umbilicus, while the whole upper portion of the tumor was covered by peritoneum placed on the stretch by the displaced organs. The tumor was inclosed by viscera at every point within reach, except just above the bladder, nearly to which the omentum extended. The empty stomach and colon lay on the surface of the tumor, resembling wet pathological preparations, and were adherent by the whole surface in contact. Notwithstanding it was suggested that the tumor might be removed from above, and by getting behind it, as these were apparently the only adhesions, I closed the incision as soon as possible.

The woman was placed in bed, and began to vomit violently, apparently from the effects of the ether. Rupture took place between the stomach and tumor, and in the course of several hours, the tumor was entirely emptied of its contents.

The fluid and semi-fluid substances were almost sufficient to fill two buckets, and were of various colors, showing that the cyst walls ruptured into each other, until at length the tumor became essentially a single cavity, and collapsed for the time. For a week or more her condition was critical, during which time she was nourished entirely by the rectum. It was feared that if food were introduced into the stomach, it would pass into the ovarian sac, and set up inflammation and blood poisoning.

At the end of a month she returned home with the tumor already beginning to refill. About a month afterwards I advised Dr. Harrison to tap her, selecting a fluctuating point above the umbilicus where it was dull on percussion, and where the stomach should have been under ordinary circumstances. I had called his attention to this peculiarity at the time of the operation, and noted the spot as being the only one where she could be safely tapped. The cyst was tapped at this point with Thomas's trocar, emptied and thoroughly washed out with warm water previous to injecting iodine. As the doctor was withdrawing the canula, and when apparently it was just out of the cyst wall, a jet of blood, a foot or more in height, was shot through the instrument. Dr. Whitwell, then house surgeon to the Woman's Hospital, was assisting and lifting up the relaxed abdominal wall with the canula in his grasp; pressure was made on all sides. It was found that as long as this was done there was no bleeding. The pressure was maintained by compresses, and, after removing the canula, an abdominal bandage was applied.

The woman was very ill for two months afterwards, suffering from inflammation of the sac, with more or less blood poisoning, followed by pelvic cellulitis and phlegmasia dolens in her right leg. She gradually recovered her health, had another miscarriage, and then a child at full term. Dr. Harrison attended her and informed me that he could detect no trace of thickening or adhesions, and he felt satisfied that these had been absorbed, and that the stomach and transverse colon had returned to their normal position.

At the time of writing this history, after the lapse of four years, she is in excellent health, and nothing is to be detected beyond some thickening in the pelvis, probably the remains of the cellulitis from which she suffered.

I do not cite this case in proof solely of the value of iodine injections, for the disappearance of the cysts may have been brought about through the occlusion, at the time of the injection, of the main bloodvessel by which they were nourished. The woman certainly suffered far more, and her life was in greater danger than would have attended the ordinary removal of an ovarian tumor.

Treatment of Ovarian Tumors by Drainage.—The occasional efficacy of this plan of treatment was known before the removal of an ovarian tumor had become an accepted operation.

The object of drainage is to establish a permanent opening through which the sac may be kept empty until it finally disappears. It was customary to establish the opening either through the abdominal walls, the posterior cul-de-sac of the vagina, or the rectum. An abdominal fistula, except for some special reason, would now rarely be made for the purpose of drainage, since no benefit could be looked for unless the opening were placed at the lowest portion of the cyst. An opening into the rectum would always be objectionable in consequence of the possible passage of flatus and feces into the cyst. Whenever the cyst is within reach it is best to establish the drainage through the posterior cul-de-sac of the vagina.

Dr. Noeggerath has reported[1] several successful cases treated by drainage through the vagina, and recommends that only one cyst should be punctured at a time as it presents, in consequence of the previous one having contracted. He has made the process far more efficacious by securing, with interrupted sutures, the edges of the opening in the sac to the incision through the wall of the posterior cul-de-sac.

With our present knowledge and facility for the removal of ovarian tumors, this operation should never be resorted to unless the tumor is so firmly adherent in the pelvis as to render it very dangerous to attempt to separate it from the surrounding tissues. Under these circumstances the treatment by drainage is admissible. The thorough washing out of the sac is important, to guard against blood-poisoning, and to lessen the amount of secretion from the lining membrane, thus preventing a serious drain upon the patient's strength. The hot water employed should, from time to time, have added to it proper quantities of tincture of iodine or carbolic acid.

Ovariotomy, or the removal of an Ovarian Tumor through the Vagina, or by an Abdominal Incision.—In consequence of local disturbance, or on account of some reflex irritation, or the mental condition of the patient, it may become advisable to remove an ovarian tumor at a very early stage of development.

While yet small, as has been pointed out, the tumor almost always lies in Douglas's cul-de-sac. To remove it an incision may be made in the septum, the tumor drawn into the vagina, and separated from its attachments.

Dr. T. G. Thomas, in Feb. 1870, was the first to undertake this operation with a distinct purpose, and the result was successful. The details of the case and the different steps of the operation are fully given in the report published in the *Amer. Journ. of Med. Sciences*, April, 1870, and in the last edition of his work on the diseases of women.

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[1] On Ovariocentesis Vaginalis. Amer. Journ. of Obstetrics, May, 1869.

Dr. J. T. Gilmore, of Mobile, and Dr. Clifton E. Wing, of Boston, formerly attached to the Woman's Hospital, have had each a successful result after this operation. Dr. Wm. Goodell, of Philadelphia, has placed on record[1] a similar one, performed by himself, and cites, in addition to these, one by Dr. R. Davis, of Wilkesbarre, Penna., and another by Dr. Robert Battey, of Georgia, making six cases of cystic disease removed by vaginal ovariotomy in America, and all terminating favorably.

Dr. Goodell also places on record the fact that the late Dr. Washington Atlee, in February, 1857, opened into an accumulation of puriform fluid filling Douglas's cul-de-sac, no clear diagnosis having been made of the case. On March 13 following, the incision was enlarged and the mass detached from its adhesions as far as the finger could reach. The operation was then suspended with the hope that nature would complete the removal of the tumor. Finally, March 25, the character of the tumor being fully determined, the mass was drawn down into the vagina and removed as the adhesions were broken up. This operation was not based on any fixed plan from the beginning, and had rather an accidental termination; therefore it should not vitiate Dr. Thomas's claims to priority.

In this interesting paper Dr. Goodell gives a remarkable case, and, as he thinks, a unique one, where an ovarian tumor was successfully removed per rectum by Dr. W. W. Shocks, and reported in the *Bost. Med. Journ.*, October 16, 1875. The tumor projected through the anus, having carried the anterior wall of the rectum before it. The diagnosis was made clear on recognizing the Fallopian tube, which could be felt from the vagina and rolled between the finger and tumor. The tumor was removed by making a longitudinal incision through the rectal wall covering it.

The history given by Dr. Goodell of his case, and of the one operated on by Dr. Wing, clearly shows the necessity for leaving the wound open for drainage, and for washing out the cavity, as a precaution against septic poisoning. Dr. Thomas secured the pedicle by means of a ligature, which was cut off and returned, and the wound closed by interrupted sutures. The woman suffered from an attack of cellulitis, which was attributed to carelessness on her own part.

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[1] A Case of Vaginal Ovariotomy. Trans. of the Gynæcological Society, vol. ii. 1877.

The range for this operation must necessarily be very limited, and confined chiefly to the conditions I have already enumerated.

Ovariotomy by Abdominal Incision.—To trace the history of this operation from its conception to its present state of development, would be an undertaking too extensive for the scope of any work so general in its character as this. A review alone of the literature would be an immense task, since the subject has attracted more attention within a few years past than perhaps any other within the range of surgery. The late Dr. Peaslee thoroughly exhausted it in his classical work on Ovarian Tumors, but within the past six years, since his book was published, more has been written in reference to it than ever before.

Through the efforts of Dr. Peaslee, the credit is now accorded throughout the world to Dr. Ephraim McDowell, of Louisville, Ky., as being "the father of ovariotomy," he having performed the operation in December, 1809, long antedating all other operators. To many practitioners in this country and in Europe we are indebted for important contributions to our knowledge of ovariotomy.

But chiefly to Mr. Spencer Wells, we must acknowledge our obligation for his great service in popularizing the operation, and making its details so familiar to us. The world is largely indebted to him for his valuable teaching, and his name will always be honored whereever ovariotomy is known.

To the remarkable success attained by Dr. Charles Clay, of Manchester, England, after 1842, we must attribute the acceptance of the operation by the profession not only in England but in this country. To him is certainly due the impulse given to the development of the operation in this country by the Atlee brothers, an impulse so favorable that, according to Dr. Peaslee, eighteen American surgeons had performed the operation previous to the year 1850. A more accurate knowledge of the operation was obtained by the publication in 1855 of Dr. Atlee's first thirty cases, and in the following year a prize essay on ovariotomy was written by Dr. G. N. Lyman, of Boston, which was the most thorough and exhaustive treatise on the subject which had appeared up to that date. After 1860 the number of operators increased so rapidly, that I cannot do more than refer in a general way to the most important contributions on the subject. Before entering upon a detailed account of the operation, a chapter must be devoted to a consideration of the conditions which may complicate it.

CHAPTER XLI.

CONDITIONS WHICH MAY COMPLICATE THE OPERATION OF OVARIOTOMY.

Inflammation of the sac—Peritonitis and ascites—Adhesions—Size and long existence of the tumor—Pregnancy—Cancer—Phthisis—Renal disease—Uterine fibrous tumors—Disease of the other ovary.

The conditions which may complicate the operation for removing an ovarian tumor are—

Inflammation of the sac.
Peritonitis and ascites.
Adhesions.
Size and long existence of the tumor.
Pregnancy.
Cancer—Phthisis—Diseases of the kidneys.
Uterine fibrous tumor.
Disease of the other ovary.

Inflammation of the sac, although of vast importance, is not always recognized. Symptoms of blood poisoning are generally present, and the appearance of the patient is indicative of a "typhoid condition." The access of the inflammation may or may not be ushered in by a chill; the pulse increases in frequency, and is attended at the outset by a great rise in the temperature of the body. The tongue is red, pointed, and dry; the teeth are often covered with sordes; there is more or less irritability of the stomach; and there are stages of moisture of the skin, or sweating, notwithstanding the elevation of temperature. The abdomen is sometimes tender on pressure, and sometimes entirely free from pain. As the case advances, the mind becomes more or less affected, even to delirium. At length the kidneys being overworked, the poison is no longer eliminated from the blood, and death begins at the nerve centres through failure of their nutrition.

This "typhoid condition" was formerly generally accepted as an omen of death. It was thought to be an indication of irreparable loss of vital force, due to the long-continued irritation exerted by the pressure of the tumor. Few were bold enough to attempt to remove a tumor from a woman in such a condition, and she was allowed finally to die without surgical relief. One of the great advances which modern gynæcology has made is, that we now recognize that this state, which was formerly thought to be ominous of death, is an indication that an immediate operation is called for. This advance could have been made only by experience, for certainly upon every *à priori* ground we should expect any patient operated on in such a condition to sink from shock before the operation could be completed.

It is true, whatever her condition, she may die from the immediate effects of the operation, but she certainly must die, and at an early day, if the cause of the blood poisoning is not speedily removed.

This condition of the patient is sometimes one of apparent exhaustion only; it is at first rather an indication that the nerve centres are overwhelmed by the presence of the poison in the blood, and not that there is an actual loss of power which cannot be regained. I have seen several remarkable instances where women were apparently snatched suddenly, as it were, from the grasp of death upon removal of the inflamed sac.

The following case will not only illustrate fully this part of the subject, but also the difficulties sometimes encountered in forming a diagnosis.

CASE LX.—Mrs. W., aged 42, consulted me Nov. 13, 1877. She had given birth to two children, the youngest then 22 years of age, and she had a miscarriage at three months, ten years after the birth of the last child. After having menstruated very freely for many years, she became irregular the year before admission, and supposed that she was approaching the menopause.

In April, 1877, she noticed for the first time an enlargement on the right side. This was recognized by her physician as a fibrous tumor, and she was placed on unusually large doses of ergot. After much suffering she was seized at the end of a month with an attack of peritonitis, which confined her to bed for three months, during which time the abdomen increased rapidly in size. Menstruation continued free, but seldom lasted more than five days. She was placed on "Cutter's diet," and at the end of a month began to lose flesh rapidly.

She had been informed by her physician, a month before consulting me, that she had a fibrous tumor, and was incurable. For one montn she had had a continuous flow.

I examined her without any knowledge of the diagnosis made by her physician, expressed the opinion and placed it upon record, that she had an ovarian tumor, the nearly solid portion of which was just below the sternum, and, between this mass and the pubes, at least two large cysts with unusually thick walls. The uterus was five inches deep, and drawn well up into the pelvis. There was no evidence of the tumor to be discovered from the vagina, but the remains of some thickening of a former cellulitis were detected on the left side in, as was supposed, the broad ligament.

Learning then for the first time the opinion which had been given by a physician of experience, and for whose intelligence and skill I have the highest respect, I advised her to consult Dr. Peaslee, and without giving him my conclusions. He decided that it was an ovarian tumor. Dr. T. G. Thomas, who was also consulted, confirmed the diagnosis.

The case was placed in my charge for operation as soon as her condition should be deemed favorable. Nov. 19, I withdrew, by means of a hypodermic syringe, some of the fluid from a cyst on the right side, where fluctuation was distinct and dulness marked; this became solid on standing a few moments. I had already taken some from the opposite side, which, remaining liquid, I had examined with the microscope, when it was pronounced not to be ovarian fluid, but its character could not be defined. This puncture of the tumor was followed by an attack of supposed peritonitis, which was marked by an increase of pulse and temperature, tenderness on pressure along the sides of the abdomen, and irritability of the stomach. After a week this attack seemed to subside, but her general condition did not improve, while the size of the tumor increased rapidly.

Dec. 8. I regarded her condition as so critical that I called Dr. Peaslee in consultation, and it was decided to tap her immediately. This I did, the patient lying on the side, and drew off 23 pints of fluid, emptying both cysts by pressing the end of the canula through the septum between the two after the first cyst had been emptied. In doing this I felt certain that I fully appreciated the relative position of the cysts, yet the practice cannot be recommended as being free from danger. When both cysts had been emptied, there remained the hard mass above, which could be felt through the abdominal wall, passing down behind as a solid body into the pelvis. She was too much exhausted afterwards to admit of a more thorough examination. Dr. Peaslee took for examination a portion of this fluid, which to the eye and by gas-light had the appearance of ovarian fluid. But the result of his examination, coupled with the character of the tumor after tapping, unsettled his diagnosis, and he was unable to decide as to its nature. I sent some of the fluid to Dr. James B. Hunter, of the Woman's Hospital, who pronounced it ovarian, but stated that he found very few ovarian corpuscles. Another expert who examined the fluid for me stated positively that it was not ovarian. Dr. Drysdale, of Philadelphia, had very kindly offered, some time before, to make an examination for me in such a case, and as I had expressed a doubt as to the uniform reliability of the microscopic test, I sent some of this fluid to him, stating that there was a difference of opinion in regard to the tumor, whether a fibro-cystic tumor of the uterus or ovary. In justice to the doctor, I must state that he found the quantity too small for a complete examination. He wrote that, "if it were not for the microscopic appearance of the fluid, he would pronounce it ovarian."

The tapping gave only temporary relief, inflammation of the sac occurred, she began to run down rapidly, and the symptoms of septicæmia presented themselves. Dr. Peaslee saw her again in consultation.

21*st*. In consequence of the irritable condition of her stomach, in which for several days she had not retained even the water from a piece of melted ice, and her general blood poisoning, it was decided to operate within twenty-four hours, under the belief that a longer delay would prove fatal. She and her friends were informed of the difference of opinion, and of the danger of her condition, but that an attempt must be made to remove the tumor, if possible.

On the following day I operated, with Drs. Peaslee, Bache Emmet, and E. C. Dudley to assist me, and Dr. Harrison to administer the ether. Dr. R. F. Weir kindly directed the spray apparatus, and took charge of all details, that the operation might be conducted under his direction in strict accordance with the antiseptic method. Dr. Crane, of Richfield Springs, and Dr. A. E. M. Purdy, were also present.

The patient had received no nourishment for several days except by the rectum; her pulse was 126, and temperature 103° just previous to the operation.

On cutting down upon the tumor I found old, firm adhesions between the tumor and abdominal wall, and I was obliged to tap immediately. Two basins nearly full of fetid pus were evacuated from the large cysts, the communication between the two remaining since the last tapping, and but for the carbolic spray, the odor would have been intolerable. The tumor was firmly adherent to the entire abdominal wall, from the stomach to the pubes, and above to the omentum. The small intestines were intensely congested from peritonitis, and the parietal peritoneum was of the same color, and inflamed behind, where it was not adherent to the tumor.

At the end of an hour and a half I succeeded in removing the tumor, the upper part of which was formed of many small cysts which gave the impression of a solid mass. A remarkable feature was the growth and formation of a large cyst from below, leaving the multilocular portion, contrary to the rule. The pedicle was ligated, dropped back into the abdominal cavity, and the external incision closed with but little delay. She was placed under the immediate care of Dr. Bache Emmet, and, although greatly reduced from her general condition, made a good recovery.

I have felt it important to enter into the details of this case, for I thus show more clearly than by a simple statement, that cases are met with in practice, where sometimes no amount of experience enables us to decide from a physical examination, as to the true character of these tumors; and further, that even in the hands of the most practised experts, the microscope cannot always be depended upon.

There are other circumstances connected with this case of the greatest importance, and although not bearing on the subject under consideration, more than the above remarks regarding the diagnosis, they may as well be cited in completing the history of the operation.

The adhesions were separated over a much larger extent than usual, but the spray seemed to control the oozing, for in instances where they have been much less, and where the spray was not used, I have been delayed by the oozing for an hour or more longer than in this case. It was noted by all present that the effect of the carbolic spray was to cause rapid capillary contraction, and that under it the amount of oozing was insignificant. The parts gradually returned to a natural color, and at the termination of the operation all appearance of the peritonitis had disappeared. The time thus gained in this case doubtless aided the patient's recovery.

But the most interesting circumstance in connection with the use of the spray was the disappearance of the septicæmia. At the beginning of the operation the patient was suffering from symptoms of profound blood-poisoning, and particularly from irritability of the stomach. She awoke from the effects of the ether as from a natural sleep, without nausea or any other evidence of blood-poisoning.

When treating of fibrous tumors I called attention to the probable effect of large doses of ergot in producing peritonitis. The history of the case just given resembles very closely several others which have passed under my observation, in which, through error in diagnosis, large doses of ergot were given, and were followed by peritonitis, which, I cannot but feel, was due to the drug. If this be true, it can only be explained by the supposition that the ergot acted as a local irritant, producing intense congestion in the pelvic vessels, and as there was no organ or condition upon which it could exert a salutary effect, inflammation resulted. I am satisfied, from observation, that an immense deal of harm is done by the injudicious use of ergot, even when the drug is indicated, and particularly in the administration of unnecessarily large doses.

Peritonitis and Ascites.—The existence of peritonitis does not necessarily contraindicate an early removal of the tumor. On the contrary, as the presence of the tumor is often the cause of irritation, peritonitis may be an indication for an immediate operation. In chronic peritonitis, where the peritoneum has been long subjected to the pressure of the tumor, its character is so materially altered, and it is so little responsive to irritation that, unless extensive adhesion exist, the patient's chances for recovery are often better after the removal of the tumor than if the peritoneum were in a perfectly healthy condition.

After rupture of a cyst in a multilocular tumor the operation should not be delayed longer than necessary, to insure a reaction from the shock. It is good practice, under these circumstances, to open the abdomen before inflammation can set in, and remove the tumor and the contents of the cyst which had ruptured and discharged into the peritoneal cavity. This is an accident which almost always terminates fatally, from peritonitis, if the contents of a cyst be left in the cavity. It is essentially a foreign body which cannot be absorbed, and, as such, excites peritonitis and ascites.

Dr. Peaslee in his work states (page 75) that he had seen five cases of spontaneous rupture of polycysts, and four of these had died of peritonitis within five days after the accident. "The remaining one barely recovered, and the tumor was successfully removed by ovariotomy about a year afterwards by Dr. T. A. Emmet, of the New York State Woman's Hospital." This remarkable case was reported by her physician, Dr. S. A. Raborg,[1] through whose recommendation she went to the Woman's Hospital. The following constitute the essential features of the case:—

Case LXI.—Mrs. L., aged 33, was attended by Dr. Raborg in her third confinement Jan. 14, 1868. Several months afterwards she noticed an enlargement, which the doctor recognized, in September of that year, as a round and hard ovarian tumor on the left side, which diagnosis was confirmed by Dr. Peaslee. On the following October 11th Dr. Raborg was sent for in great haste to see the patient, who had been out riding, and was then in a state of collapse. This was doubtless due to the rupture of a cyst. The kidneys were very active for several days, but the peritoneum began to fill, and four months afterwards she was tapped by Dr. T. C. Finnell. Present, Drs. Raborg, Peaslee, Bigelow of Ga., the house staff, and others. The girth of body at the umbilicus was thirty-seven and a half inches. She was admitted to the hospital Sept. 28, 1869.

Oct. 25. An incision was made extending from the umbilicus to the symphysis pubis. The abdominal walls were very thin, and a considerable quantity of fluid escaped from the peritoneal cavity, evidently having come from a cyst which ruptured Oct. 11, over one year previous. There was a chronic peritonitis, but no adhesion to the abdominal walls, only one to the omentum. A Wells' trocar was plunged into the tumor, but no fluid escaped until the colloid or jelly-like contents had been turned out with the fingers; then a dark, grumous fluid was evacuated, changing in color and density as one cyst after another was punctured. The pedicle was secured by a silver suture passed like a cobbler's stitch, and the stump was returned into the abdominal cavity. There was nothing remarkable to note in the convalescence. She bore two children afterwards, and

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[1] New York Med. Journ., April, 1876.

Dr. Hadden of this city, who attended her, informed me, October 6, 1873, that she had passed through her labors without difficulty. Dr. Taborg sums up the points of the case as follows: "The special interest in the case is, in the first place, that a multilocular tumor should rupture, emptying the contents of one of its cells into the peritoneal cavity, and the patient survive the shock and consequent inflammation; secondly, that from the history of the case there is little doubt that this rupture never healed, and the secretion from the sac continued to flow into the peritoneal cavity up to the time of the operation, or for more than a year. The original well-marked tumor without dropsical effusion around it, the condition as witnessed by Dr. Peaslee and myself after the rupture: the distinctly marked tumor again after nature had disposed, by diuresis and other means, of a large portion of the fluid, six weeks later, showing it was not ascitic; then the description given by Dr. Finnell of the appearance of the abdomen when he tapped it; and finally, the fact that a large quantity of fluid was found by Dr. Emmet when he performed ovariotomy—all go towards proving this assertion to be correct."

Mr. Wells, in his work on "Diseases of the Ovaries," reports a case of rupture, where nineteen pounds of a calf's-foot-jelly-like matter, which had escaped into the peritoneal cavity, from a rupture of a multilocular tumor, was removed together with the tumor. The patient was already several days after the accident suffering from a low form of peritonitis, and died forty-four hours after the operation. But he has since saved the lives of several other similar cases by operating promptly.

The presence of ascitic fluid and a long existing peritonitis are closely connected, and furnish no special indication for delaying the removal of any coexisting ovarian tumor, although either condition alone, or both together, might influence the prognosis. It has been thought that the presence of fluid in the abdomen with a tumor was a certain indication of malignant disease. This, however, has not been borne out by observation, although malignant growths in the abdominal cavity are generally accompanied by more or less effusion.

Peritoneal accumulation takes place occasionally as a simple mechanical effect of the pressure of the tumor. The prognosis is affected by various circumstances, such as disease of the heart, liver, or kidneys, and especially the latter, as the renal excretion is often seriously diminished by the pressure of the tumor. Unless the growth is of a malignant character, the chances for recovery after its removal are favorable; the peritonitis will subside, and the accumulation can not again take place. When ovarian tumors have become the seat of papillary growths, peritonitis and ascites are sometimes caused by rupture of the cysts and the escape of the fluid contents into the cavity. It has been stated, when describing the microscopic appearances of ascitic fluid, that such a condition of the ovary is not necessarily malignant. This opinion is based on the fact that women are known to remain in good health for many years, and the peritonitis disappears, notwithstanding the peritoneum may have been for a long time bathed in fluid filled with the contents of ruptured cysts. The prognosis, however, is not so good in these cases, as such patients do not bear tapping or the operation for removal so well as those with simple ovarian tumors. The accompanying depression of the vital power is due to the constant drain which deprives the blood of its most important constituents.

The presence of ascitic fluid is a great protection against the formation of extensive adhesions. Therefore, when a patient is tapped for the purpose of making a diagnosis, as is often necessary, the whole of the fluid should never be removed from the abdominal cavity, unless the operation is to be performed immediately.

The proper point for tapping is in the abdominal wall between the umbilicus and pubes. It has, however, been often advised under certain circumstances to tap through the posterior cul-de-sac of the vagina, as it is the most dependent point, but this method is not advisable. The following remarks made by Dr. Chadwick, of Boston, in a discussion on vaginal ovariotomy, at a meeting of the Gynæcological Society,[1] fully coincide with my experience. "I do not believe that the fluid ordinarily poured out by the inflamed peritoneum should be allowed to escape; for I regard it as nature's means of floating up the intestines from out the pelvis, and thus preventing adhesions between them and the pelvic organs, which might subsequently give rise to most unfortunate complications. If that effusion were drained off by a vaginal opening, the uterus, bladder, intestines, etc., will be likely to contract adhesions with one another, from which they may not be free for months, if ever. These remarks, however, do not apply to effusions which, for one reason or another, are undergoing decomposition or suppuration, and are, therefore, likely to poison the patient's system, should they be absorbed."

Adhesions.—Under ordinary circumstances, we are able to form no idea as to the existence or extent of adhesions previous to the operation. When an ovarian tumor is felt from the vagina to be unusually low and filling up the pelvis, we may suspect that adhesions exist in this neighborhood. This supposition may be apparently confirmed by the immovable condition of the tumor, and yet no opinion based on physical signs could be more unreliable. It is rare at the present day for an operation to be abandoned on account of the adhesions, because it is well established that the woman's life will be placed in greater danger if the operation be left incomplete. The extent of the adhesions to the abdominal wall or omentum is deemed of little consequence. They only become serious when they exist between the tumor and the liver, bladder, uterus, or rectum. It has been generally held that extensive adhesions to the viscera, which are in constant motion, do not take place. This is true, as a rule, for the small intestines are rarely found involved, and the case which I have cited as having the stomach and colon so extensively adherent to the tumor is, in all probability, unique. Adhesions to the bladder are to be regarded as the most serious. This statement is based on the fact that a degree of shock rarely met with under other circumstances, particularly where the lesion is so limited in extent, nearly always follows the breaking up of such adhesions. The adhesions to the abdominal walls are always to be torn from the surface of the tumor, but this method should never be attempted when they are situated elsewhere. If the tumor be found attached to the liver, intestines, or bladder, the adherent portion of the sac must be left undisturbed, as will be described hereafter. The walls of an ovarian cyst sometimes become agglutinated to a greater or less extent throughout Douglas's cul-de-sac along the posterior surface of the uterus, and it would be hazardous to separate them from either the rectum or uterus, since the hemorrhage would be great, and in a location where it could not be controlled. We have no other resource in such cases but to remove as much of the tumor as possible, and then attach the remainder to the lower angle of the wound, and this plan is the only one to be adopted with certain forms of fibro-cysts. This must, of course, seriously complicate the case, on account of danger of inflammation and blood-poisoning.

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[1] Gynæcological Trans., vol. ii. p. 276.

A drainage tube should be placed in such a pouch, and when the cyst is adherent to the bottom of the cul-de-sac a permanent opening into the vagina below should be established, to facilitate the drainage. Under the most favorable circumstances the lining membrane of this pouch will remain for a time a pus-secreting surface. If an opening exists above, through the abdominal wall, and below into the vagina, favorable results would follow the injection of iodine and the frequent washing out of the cavity. I have lost, within a few months, such a case from tetanus, although it had been doing well for several days before the tetanic symptoms developed, and I have regretted that a counter-opening was not made into the vagina.

Dr. Sims[1] advocated, as a guard against blood-poisoning, the practice of establishing an artificial opening through Douglas's cul-de-sac into the vagina, for the purpose of draining the peritoneal cavity of the bloody serous effusion always thrown out after the breaking up of adhesions. The practice has, however, not proved an advantageous one, from the fact that the admission of air and the presence of the foreign body needed to keep the passage open excites a large amount of secretion, which would not otherwise occur. But the most important objection is in the exposure of the raw surfaces of the opening to being continually bathed by the fluid drained from above, thus subjecting the patient to a greater danger from absorption than would exist under ordinary circumstances.

Where extensive adhesions have been separated, and the oozing from the remaining raw surfaces is proportionately great, it is essential to provide some outlet for it. M. Koeberlé first used a glass tube pierced by a number of small holes, passing it to the bottom of Douglas's cul-de-sac from the lower angle of the abdominal section. Through this tube the fluid drained away and the cavity was washed out. Dr. Keith afterwards brought it more into practice, increasing the size of the tube and adding a rim, or flare, to prevent it from falling into the cavity. Dr. T. G. Thomas modified the shape of Keith's instrument by curving it somewhat in the central portion.

Dr. Peaslee[2] had previously practised washing out the peritoneal cavity with an artificial serum, through an opening left in the lower angle of the incision, which was kept closed by a linen tent. My experience has demonstrated that this method can only be employed to a limited extent. I have found after death that the exudations from peritonitis would become sacculated or break down and be encysted as pus, within a short distance of Douglas's cul-de-sac, where the force of the injections could not overcome the adhesions, or, if they did overcome them, would produce fatal hemorrhage.

The Size and Long Existence of the Tumor.—The size of the tumor does not complicate the operation, unless this is delayed until the kidneys or other organs have received some serious damage from long-

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[1] New York Medical Journal, 1872.

[2] American Journal of the Medical Sciences, April, 1863.

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The incision through the abdominal wall was closed with interr[illegible] silver sutures, and with difficulty. Notwithstanding the serum [illegible] been continually oozing from the oedematous tissues, their edges were still thick, and it was feared that the parts would not be prop[illegible] adjusted when the oozing ceased. To provide against contingency the sutures were introduced at such a distance from the edges that a width of at least two inches of peritoneal surfaces were brought together.

The operation lasted two hours and a quarter. The patient was weighed both before and after the operation as she lay upon the table. The tumor was thus found to have weighed seventy-nine pounds, and the patient only ninety.

She reacted well, but several abscesses formed in the line of the wound, and when the sutures were removed, there seemed to have been no union, in consequence of the œdematous state of the tissues, and the edges gaped. For nearly the whole length of the line the peritoneum was put on the stretch, and at one portion the separation between the edges was half an inch in extent. This early union of the peritoneal surfaces was a fortunate circumstance, as it prevented the fluids from entering the peritoneal cavity. The edges were kept in as close contact as possible, and the traction upon the peritoneum relieved by the use of adhesive straps. The parts healed, to a great extent, by granulations, and convalescence was necessarily tedious, but ultimately there was a good recovery.

The sutures which had been placed in the fold of abdominal tissue, to arrest the oozing, were removed on the third day. At that time a fold no longer existed, for in the retraction of the over-stretched tissues this had disappeared, and consequently the tissues were not put on the stretch and tore apart when the sutures were removed.

The recovery of this woman was remarkable, if we take into consideration her size, the amount of fatigue she endured in her condition, the anxiety of mind, the duration of the operation, and the difficulties of the convalescence.

This was the largest ovarian tumor I have ever removed. The average weight (Peaslee) in Dr. Keith's first hundred cases was thirty pounds, but he removed one weighing one hundred and twenty pounds, the largest ovarian tumor ever removed successfully from the living body.

Long Existence of the Tumor.—But little in addition can be stated in relation to the duration of the tumor, beyond what has been already advanced. If an ovarian tumor cannot be removed at an early period of its growth, before adhesions have formed, the longer an ovarian cyst has been developing, as a rule, the better, for the patient will then bear the operation with less constitutional disturbance after she has become accustomed to the life of an invalid.

Pregnancy.—As a general rule an ovarian tumor should not be removed if early pregnancy coexists, from the fact that in a certain proportion of cases miscarriage will occur and the patient die. But it would be equally wrong to permit a woman to go to full term without relief, if she were likely in consequence of the size of the [illegible] to suffer from the effects of the additional pressure, whereby the [illegible] of both mother and child may be brought about. We have always recognize the danger of additional adhesions forming in some [illegible] manner or place, as a consequence of the displacement of the [illegible] by the enlarging uterus. These may be of such a character as to render the removal of the tumor afterwards impossible, as was the [illegible] with the patient in whom the stomach and colon became adherent to the tumor. Moreover, the lives of both may be lost if this [illegible] degree of distension be permitted to continue when indications [illegible] of functional derangement in the action of the kidneys, or of impaired nutrition elsewhere. The danger of rupture of the tumor, and its consequences to both mother and child, must always be considered in advanced pregnancy, and finally the evil effect of a tedious labor [illegible] the child, even if the mother should escape, should be remembered.

If the tumor be unilocular, tapping should be resorted to for temporary relief. But should it be multilocular, and the case as described above be an urgent one, the tumor should be removed without delay, in the interest of the mother. Fortunately when the operation is [illegible] before uræmic symptoms have become marked, the recovery of the mother will not be complicated necessarily by the existing pregnancy, and the probabilities will be good for the future progress of the gestation to a favorable end.

Mr. Wells has operated ten times, where pregnancy existed, for removing ovarian tumors, having but one death, all the others recovering and going to full term. He has been successful also in removing a tumor without affecting the pregnancy where peritonitis already existed as a consequence of rupture of a cyst, and the escape of its jelly-like contents into the peritoneal cavity.

Dr. Sims removed, in 1860, a very large unilocular cyst, without adhesions, from a private patient, between the third and fourth months of pregnancy. I had charge of her after the operation; the pulse never rose above ninety per minute: she recovered without a bad symptom, and had three children afterwards.

Dr. W. L. Atlee also operated on a case under the same circumstances, and without any bad consequences.

Dr. Playfair has collated (Peaslee) fifty-seven cases of this complication, in thirteen of which the mothers were lost; in seven cases where the cyst was punctured, they all did well, and gestation was not interrupted. Dr. Braxton Hicks cites eight instances of ovarian tumors complicated with pregnancy which went to full term, and were delivered of living children.

Cancer, Phthisis, Diseases of the Kidneys, etc.—We may be able to recognize the existence of cancer by microscopic examination, but we can form no estimate as to the extent of adhesions, in a knowledge of which must rest the advisability of attempting to remove the mass. Therefore, in every instance, after withdrawing the ascitic fluid, the abdominal incision must be enlarged sufficiently for the purpose of gaining this information. The patient must always have the benefit of the doubt, since she can have but a very limited future if a growth of this character be left undisturbed, while it is a well-admitted fact that she may gain a new lease of life, for an indefinite time, if certain growths are thoroughly removed, which might in time become malignant in character. Should the appearance of the patient indicate the cachexia, so characteristic of the advanced stages of malignant disease in other parts of the body, the operation for removal should not be attempted. We may prolong life by tapping, but more than this should not be attempted, for the nerve centres are already poisoned by the condition of the blood, and the patient is consequently unable to react from the slightest shock.

Phthisis is fortunately not a common complication, although it may exist in a certain proportion of cases, and its origin may be in some way related with the development of the tumor; but the coexistence of the two does not usually indicate a mutual dependent relation, or the existence of a common cause. In the early stages of the pulmonary trouble, the deposit of tubercle may be at least temporarily arrested by removing the ovarian tumor, so that the pulmonary circulation may be less obstructed. In the advanced stages of the disease, no other benefit can be hoped for from any operative procedure beyond relief to the breathing, and when this can be obtained by tapping, it should be employed.

The Condition of the Kidneys is a most important matter in ovariotomy, for on their even more than usual activity depends a favorable termination in every case, unless it be unusually simple in character. Any functional disturbance of them will be relieved by increased action of the skin, and will entirely disappear after the removal of the tumor. But if advanced organic disease exists, we must be prepared, in all probability, for a fatal termination of the ovariotomy. I am confident that I have lost a case after removing the tumor, in consequence of disease of the kidneys, their action having been entirely arrested in the effort to eliminate the ether. We should always be on the lookout to prevent the kidneys from being overworked, and endeavor to relieve them by inducing an increased action of the skin and bowels.

When other organic diseases complicate ovarian tumors, we must determine in each individual case the propriety of operating, or of gaining temporary relief and time by tapping.

Uterine Fibrous Tumor.—This complication is not common. I have met with but a single instance, the one referred to by Dr. Peaslee in his work (page 97). In this case ascites also existed, and it was necessary to tap before the diagnosis could be fully formed. Dr. Peaslee states that he had met with several instances. As long as the two tumors (ovarian and uterine) are but moderately enlarged, it is not difficult by means of a sound in the uterus to judge of their mutual relation. If in operating, the abdominal section be made sufficiently large, the presence of the uterine growth will scarcely add much to the difficulties of removing the ovarian tumor. If the complicating uterine tumor were a fibro-cyst instead of a fibrous growth, it would be somewhat likely to become pedunculated by the pressure of the ovarian tumor, sufficiently to admit of its removal also.

Disease of the other Ovary.—It is not uncommon to find a tumor in each ovary in different degrees of development. Koeberlé found both ovaries involved in nearly one-fifth of all of his cases, a somewhat larger proportion than is found by other operators. But all have met with a certain number, and it seems to be the general experience that double ovariotomy does not materially increase the risk of the operation.

CHAPTER XLII.

GENERAL DETAILS IN OVARIOTOMY.

Proper time for operating—Preparatory treatment—Instruments—Preparations for the operation—Mode of treating the pedicle.

Proper Time for the Operation.—No inflexible rule can be laid down as to the proper time for removing an ovarian tumor. Each case is a law unto itself in this respect, to determine which a ripe experience and a careful judgment are essential. Some women suffer more at an early stage than others do later, even when there is a considerable degree of distension. Some bear the suspense badly, and their anxiety of mind tends so greatly to impair their physical condition that an early operation is imperative. In general terms it has been thought, until recently, that surgical interference should be delayed until it became evident that the general system was beginning to be affected, as indicated by loss of flesh about the neck and upper part of the chest, by disturbance of digestion, and by more or less obstruction to the action of the lungs and heart. It has been claimed that a judicious delay enables the peritoneum to become more tolerant to irritation and much less liable to inflammation than it would be were the tumor removed at an early stage of its growth. But on the other hand, the patient was deprived of all chances of recovery when the removal was delayed until the vital powers became so much depressed that she could not react from the shock of the operation. The best results were then to be expected as soon as the patient had been toned down, or physiologically adapted, as it were, to the operation. But a great change has been brought about in the treatment of these tumors within a very recent period, and the rate of mortality has been reduced in a remarkable degree. With greater experience in the method employed, it has already been demonstrated, as we shall see hereafter, that all the advantages are now greatly in favor of an early operation before adhesions have been formed.

Preparatory Treatment.—It is very important to bring about a healthy action of the bowels, skin, and kidneys previous to operating.

The long-continued pressure of the tumor induces a greater or less accumulation of feces, which should be removed as well for the comfort of the patient as for the success of the operation. The means to be employed for the removal of the scybalæ will also remove the flatus. Without this preparatory treatment the operation is often rendered more difficult of execution, and the ultimate success more uncertain. Whenever the intestines are distended by flatus, it is almost impossible to keep them within the abdominal cavity during the operation: moreover, any increase in their bulk, by distension, may render it difficult to make any inspection that may be necessary for detecting the source of bleeding. The comfort of the patient also, after the operation, may be diminished by flatus in the bowels, and if the pedicle is short, and has been secured in the wound by clamp or stitch, it may be so much displaced as to bleed, or so much irritation be established as to excite peritonitis.

A proper condition of the skin tends to insure a healthy action of the bowels, kidneys, liver, and lungs, which will render the circulation in the capillaries more active and thus diminish the risk of inflammation and blood-poisoning. My experience leads me to believe that a certain proportion of cases suffer from peritonitis, and possibly septicæmia, after the operation, because the action of the skin has not been previously attended to.

The influence exerted on the other organs by a healthy action of the skin is a fact too well established to need any further discussion. It is, therefore, evident that, if the skin be inactive, the elimination of any new poisonous material resulting from the operation will be greatly lessened. During the growth of an ovarian tumor the circulation tends to become so imperfect in the capillaries that, even under the most favorable circumstances, the skin is, as a rule, dry and inactive. Hence I always address my treatment first to the skin, and find that the bowels are thereby more easily acted on afterwards.

A steam bath is the most beneficial in its effect, and where this cannot be obtained a hot-water bath may be given. After the body has been well washed with soap, and dried, the skin, particularly of the extremities, must be rubbed thoroughly by the hand smeared with vaseline. The body should be wiped off with a piece of soft flannel, so as to remove all excess of grease, some hot diluent drink administered, the patient then covered up warm in bed to increase the action of the skin, and to obtain rest by sleep. This process might be gone through with for several nights just previous to the operation, or employed two or three times a week if there should be no urgency in the case.

Whenever the condition of the patient will admit of it, a brisk cathartic should be administered, with the view of unloading the portal system. Podophyllin often answers well for this purpose, and its irritating effects may be generally counteracted by combining with it a small quantity of the extract of belladonna. But I employ a combination of calomel and soda more frequently than any other purgative, following it by several doses of castor oil, which is the most reliable of cathartics when the strength of the patient is much reduced.

Without regard to the special cathartic employed, it will always be beneficial to administer one or more enemata of hot water and inspissated ox-gall, the patient being placed on the knees and elbows, after the manner already described. Thus given, these enemata distend the colon and constitute the most efficient means at our command for removing both scybalæ and flatus.

As recommended by the late Dr. Peaslee, the patient's diet should consist chiefly of milk porridge for several days before the operation. This is made by boiling for an hour, equal parts of milk and water, thickened with flour, with the addition of salt in preference to sugar. It has been found that this diet does not distend the intestines with flatus, and that under it the patient suffers less from fecal accumulation. When meat is needed, thick and tender lamb rib chops, just cooked through, and not under-done, answer well, as they are more easily digested than any other meat except that from the breast of game birds. It is advisable that the diet of the patient, for several days before the operation, should be of the simplest character consistent with the maintenance of her strength. To insure the best physical condition for the operation, it will be necessary for the patient to obtain undisturbed rest during the previous night, and to guard against the ill effects of over-anxiety an anodyne should always be administered. About noon, or shortly afterwards, the patient will be found in the best condition for the operation. Some three hours should have elapsed after taking food before administering the anæsthetic, and if in the mean time it be necessary to sustain the patient, a little beef-tea and brandy should be injected into the rectum.

At the time of the operation the patient should be clothed in a flannel shirt and drawers, a night gown and stockings. As the last thing before entering the operating room the patient should empty her bladder.

It is all-important in this, as in any other capital surgical operation, that the day selected should be bright and clear, with a westerly wind, for our portion of the world. A cold, raw, and easterly wind will sensibly affect the nervous system of any healthy organization, and may cause the death of a patient when in a feeble condition. The depressing effects of an easterly wind, ladened with moisture, will be well marked on the nerve centres of a feeble organization, rendering reaction from the shock of the operation difficult. Whenever the patient is feeble, I never hesitate to postpone the operation to a more favorable day, unless reasons exist which render delay inadvisable.

A room with the windows having a southerly or westerly exposure is best fitted for the operation; its temperature must be kept at 80° throughout the whole time.

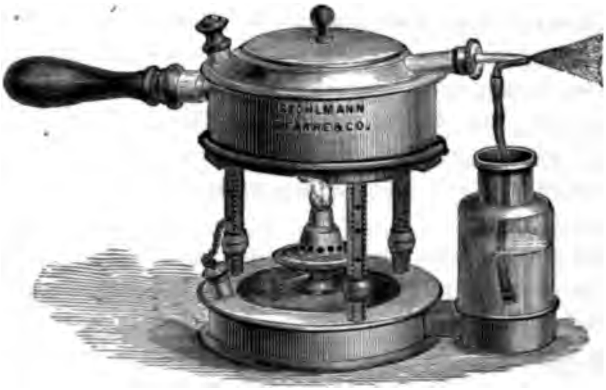
A table similar to the one for ordinary examinations will answer for the operation. It should be covered in the same manner by several blankets, and over all a sheet of India-rubber cloth. Several pillows are needed. The operating table must be placed near the window, so that the lower limbs of the patient will be in that direction, leaving space enough for a small table, to be used for the instruments, and for the assistant to stand in charge of the spray apparatus.

The number of instruments recommended for this operation is most formidable, but the essentials, in addition to the ordinary gynæcological case, are very few. A scalpel, a few pairs of forceps for seizing bleeding vessels, a grooved director, a trocar having several feet of tubing attached, vulsella for drawing out the sac, a clamp for securing the pedicle, a cautery apparatus, sponge holders, various scissors, a glass drainage tube, needles, and the usual instruments for applying silver sutures. All these should be thoroughly cleansed and placed on the table in a shallow vessel containing some disinfecting fluid. A number of large, straight sewing needles like those used for the perineum, should be threaded with a short loop to which the silver wire must be already attached. Several silk ligatures of sufficient strength, but not too large, should be prepared for the pedicle, if to be secured by this method, together with a number of ligatures for securing bleeding vessels. All of these should be placed together at some convenient point, and under the special charge of an assistant. A number of pieces of linen with the edges hemmed, and about eight inches square, should be provided and placed in a solution of carbolic acid. These are to cover the tissues as they are handled; they were first used by Koeberlé.

It is of sufficient importance for the operator himself to examine carefully the sponges. They should be fresh sponges carefully selected and prepared for the operation. All portions of shell or other foreign matter, must be first carefully picked out, and the sponges well washed with soap, and thoroughly boiled for some time. It is well to expose them for several days to the action of the sun, pick them over again and finally wash them in a hot solution of carbolic acid; they may then remain until used in a weak solution of the acid.

A spray apparatus, or better two, should be selected with a sufficient capacity to remain in operation for at least two hours without needing to be replenished. A number of these have been devised in this country, more or less on the plan of Lister's original instrument. The modifications by Drs. Weir, Thomas, and Hanks are in more general use, and each has some special point to recommend it.

Fig. 126.



Weir's steam spray apparatus.

[1] Three solutions of the carbolic acid will be needed, and that for the spray apparatus should be made from absolutely pure phenol, as it is found to be more soluble and less irritating. The first solution should be in the proportion of 1 to 40, to be used for the protective and the gauze covering. The second solution for the spray should be 1 part to 30, and the third solution 1 to 20. The latter solution will be of the strength needed for purifying the sponges and all the instruments, and they should be allowed to remain in it for at least half

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[1] To Dr. Robert F. Weir, I am indebted for all my knowledge on this subject, obtained either by personal instruction from himself, or from his paper "On the Antiseptic Treatment of Wounds and its Results," New York Medical Journal, Dec. 1877, and Jan. 1878, to which I refer the reader for more general information on the subject.

an hour before commencing the operation. It is yet a question to be determined by experience, if other agents, less irritating and at the same time as effective, can be used in the place of the carbolic acid spray. Salicylic acid has been used in the proportion of 1 to 300, but it has no advantage over the thymol solution, which is unirritating; but this has yet to be subjected to further test, and its greater efficacy proved before the carbolic acid is to be abandoned for it.

The formula used at the Woman's Hospital for preparing the thymol solution is fifteen grains of thymol to three drachms of alcohol, half an ounce of glycerine, and thirty-four ounces of water. The directions are to heat the alcohol until it is hot, dissolve the thymol in it, and then add the glycerine and water.

The tissues constituting Lister's dressings are, antiseptic gauze, a coarse cotton fabric, known in commerce as cheese cloth, carbolized by a certain process; some mackintosh or thin rubber cloth to cover the abdomen, some oil silk, which has received a thin layer of varnish on one side through which the carbolic acid cannot penetrate, and called the protective; and a quantity of carbolized jute. The ligatures, whether of silk or catgut, should also all be carbolized.

Six assistants will be needed, and the spectators should be limited in number.

A warm blanket should be spread over the lower end of the table, with which to envelop the legs and feet of the patient as they hang over to rest upon a chair. Her nightgown and undershirt should be rolled up to a point at which they cannot become soiled. A small pillow should be pushed under the middle of her back for support, and the other pillows so placed at an angle as to make her position comfortable. The operator will select the side of the patient on which he is to stand, according to the direction of the light, or as he may have a preference. He will then need an assistant to stand between him and the instrument table, but just behind him, so as not to obstruct the light or spray. His chief assistant will stand on the other side of the operating table opposite to him, ready to sponge when necessary. A third person may stand at the side of the chief assistant nearest the patient's head, for the purpose of keeping up steady pressure, while the tumor is being emptied. This he does by applying his open hands flat on each side of the abdomen. Afterwards he may be needed to assist the person giving ether, and to look after the condition of the patient, and to give hypodermic injections of brandy, if they shall be needed. The person administering the anæsthetic should be particularly skilled therein, and so familiar with the operation that he may not neglect the anæsthesia in his anxiety to witness it. The operator should on no account have his attention called from the work before him. The fifth assistant should have charge of the spray apparatus, and the sixth one is to wash the sponges. The assistant with the spray should stand by the window on the side of the instrument table opposite to the operator, with a rest for the apparatus, so that the spray may be directed obliquely along the line of the incision and just over it, avoiding the patient's face.

As the patient passes under the influence of the ether, a folded napkin should be placed between her knees, the legs tied together and secured, if necessary, to the back of the chair, or better to the table. A piece of oiled silk four feet long and not quite so wide should be placed over the bare abdomen. From the centre of this a circular piece, sufficiently large, is to be removed, and the edges of the oiled silk, to the width of an inch or more, spread with the material for forming an adhesive plaster. This opening will expose a sufficient portion of the abdominal wall to allow the operation to be completed. As the edges of the oiled silk are adherent all around, the clothing below will be protected, as well as a portion of the patient's body. A large receptacle must be placed under the table for receiving the contents of the tumor, and alongside of it a small hand-bowl, to be used for the same purpose when more convenient. Near by must be placed a supply of towels and a basin of warm water, in which the operator may dip his hands from time to time, and it should be the duty of some one person to change frequently the water during the operation. Before beginning the operation it must be seen that in front of the fire, or heating apparatus, have been placed several blankets, a change of clothing for the patient in case she should need it, and a sufficient supply of hot water. The patient's bed must also be properly prepared. It should be narrow, that the patient may be readily reached; the mattress should be of hair, and hard, protected by a rubber sheet, and covered by a blanket and cotton sheet for the patient to lie upon. Along the centre of the bed a number of vessels of hot water, tightly corked, are to be placed, and covered up by the bed clothing.

Every preliminary detail having been attended to, it remains for the surgeon to prepare himself for the operation. The most important part of this will consist in thoroughly cleansing his hands, for the death warrant of many a patient is carried under the nails of the operator. The nail-brush must be used with hot water and soap, and carbolic acid afterwards. Moreover, the chief assistant, the one who is charged with washing the sponges, and any one who is likely to be called upon to handle the sponges or instruments, or to place his hand in the wound, should cleanse and disinfect his hands in the same manner.

Mode of Securing the Pedicle.—In order to avoid repetition, and not to be interrupted in our description of the operation proper, we will first consider the different modes of treating or securing the pedicle. The best method is still an open question, but, if the operator has no preference, it is determined somewhat by the character of the pedicle, the choice lying between the use of the clamp or ligature, and possibly, the cautery, under certain circumstances. Sometimes the tumor is enucleated in the absence of a pedicle. In general terms it may be stated that the use of the clamp is to be restricted to a long pedicle, and the cautery to a narrow one with small vessels. The ligature, in all probability, will become in the future the means generally employed for securing the pedicle. For a number of years I have used the silk ligature exclusively for this purpose, and have dropped the pedicle back into the abdominal cavity, although I had been previously opposed to the practice. The opposition to the ligature was based entirely on theoretical views: I feared that the silk would act as a foreign body and lead to the formation of abscesses, but experience has disproved this.

In my first operations I ligated and attached the pedicle in the lower angle of the wound, as had been recommended by Langenbeck, and afterwards by Dr. H. R. Storer. Then I employed for a short time the clamp, which proved in my hands the least satisfactory method for treating the pedicle. For several years afterwards I secured the pedicle by means of silver wire introduced like a shoemaker's stitch.

Dr. Peaslee in his work, page 442, credits Dr. Murray, of the Great Northern Hospital, London, with having proposed, in 1865, the application of a ligature to the pedicle in the form of the figure 8, and states that " Dr. T. A. Emmet reported his use of the silver wire in the same way in 1870" (*Am. Journ. of Obstetrics*). This is an error, as I seldom used the figure-of-8, but took at least three stitches, and the number could be extended indefinitely, like cobbler's stitches, while Dr. Murray's purpose was simply to secure the pedicle, by silk or any other means, in two sections.

I used a somewhat larger wire than that generally employed for surgical purposes, and in sections about a foot long, with a large straight needle attached at each end, the wire being twisted through the eye.

While an assistant held up the pedicle, so that the light might be transmitted, I selected a spot clear of vessels, through which I passed a needle, and from the other side another needle, along the same track, but in opposite directions. This was repeated at short distances, and the intervals between the stitches were compressed by tightening the wires. The pedicle would be thus included in three or four sections according to its size, and the ends of the wires were twisted and cut off. At each section, in turn, the wire was tightened, but before being twisted, the stump of the pedicle was seized by the operator between the thumb and forefinger, and traction was made first on one wire and then on the other. If traction were made on both ends at the same time, only one section would be compressed, for the suture would bind where the wires crossed. But with traction on one at a time the wire would be drawn straight so that the tissues could then be easily run together, as it were, or compressed between the fingers, and then the other wire could be drawn up in the same manner. The ends were twisted, bent flat, and cut off, with the twisted portion about an eighth of an inch in length. The wire when thus used remained so imbedded in the tissues and covered by the stump as to be hidden, where it became encysted and caused no irritation afterwards.

I used a temporary clamp, placed generally next to the uterus, and, that the tissues should not be bruised, I employed one made on the principle of that used with Chapman's India-rubber ice bags, in which simple, round, and flat surfaces are brought together. Then just before the ends of the wires were twisted, but while in the grasp of the forceps, the clamp was always carefully loosened. If bleeding then took place, the wires were drawn tighter, while the escape of blood could be easily controlled by the grasp of the fingers.

If oozing should occur from one particular section, after the ends of the wires have been secured, it is easy to tighten that portion by hooking a tenaculum under the wire, and giving it several turns upon itself. This suture should be placed as near to the uterus as can be done without causing undue traction, and with the purpose of leaving the stump clear for an inch or more beyond the constricted portion. If this precaution be neglected and the tissues are trimmed too close to the suture, the portion of pedicle within the grasp of the end loop may be pulled out by the traction, and the patient die from loss of blood.

I am ignorant of any means except the clamp, for securing the pedicle in as small a bulk as can be done with the cobbler's stitch. I secured the pedicle in some fifteen cases by means of this stitch, and in every instance, with a single exception, where I cut the tissues too close, I was fully satisfied with its action. In this case it was found, after death, that nearly a pint of blood had been gradually lost. during some three days, from a portion of the pedicle which had slipped from the end loop. If the hemorrhage had not been the immediate cause of death, which was probably the case, the consequence would still have been serious, if the patient had ever reacted. I had been closely watching Dr. Peaslee's practice for some time, and, finding that his results were good from the use of the silk ligature, I abandoned the silver wire. Yet there are conditions where the cobbler's stitch might be employed with great advantage for bringing surfaces together about the pelvis, and when an interrupted suture cannot be applied with accuracy. It can be used in vascular tissue with more safety than any other suture, and even if the stitch should pass through the centre of a large vessel, the bleeding would be arrested by the compression exerted on all sides. The silver wire becomes so thoroughly encysted that, when death occurs after a week. it is exceedingly difficult to find it.

In some respects iron wire, even of a smaller diameter, might be preferable on account of its strength, and from the fact that the iron may, in time, become oxidized and be absorbed.

Dr. Nathan Smith, of Connecticut, in 1821, according to Dr. Peaslee, was the first to ligate the vessels of the pedicle, to then cut the ends of the ligatures short, return the stump, and close the external wound. Dr. D. L. Rogers, of New York, in 1829, and Siebold in 1846, followed essentially the same plan of operating. Dr. W. Tyler Smith of London, as late as June, 1861, adopted the method, and in consequence of his connection with giving it prominence, the plan of practice is generally associated in England with his name.

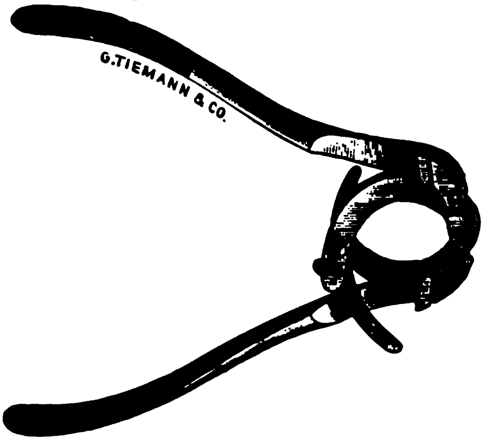
The pedicle has also been ligated by means of carbolized catgut. which has been recommended not only on account of its antiseptic properties, but from the fact that it is rapidly absorbed and will disappear within a few days. But in this property lies the danger from its use, since death has occurred in consequence of hemorrhage where the ligature has been absorbed before the vessels have become obliterated. This material cannot be tied in so compact a knot as silk, and has no advantage, for the silk also in time disappears.

The clamp was first adopted by Mr. J. Hutchinson, of London, in

1858, and his first instrument was the carpenter's caliper compasses, which he afterwards improved by removing the handles. This instrument was at one time the favorite means for securing the pedicle, but it is now seldom employed. It has, however, always been the favorite means used by Mr. Spencer Wells, and the endorsement of the value of the instrument by one who has already removed more than nine hundred ovarian tumors demands for it more than a passing notice.

There are two great advantages in the use of the instrument—bleeding from the pedicle cannot take place without being detected, and no foreign body in connection with the pedicle is left within the abdominal cavity. On the other hand, unless the pedicle be a long one, the patient suffers in consequence of the traction exerted when the abdomen becomes distended by flatus. To this irritation can be traced the occurrence of peritonitis, as I have frequently thought. The objection has been advanced that this binding down of the uterus would have a bad result in a future pregnancy. This, however, cannot be a permanent condition, for I have often seen pregnancy advance without causing any apparent traction to be exerted on the uterus. It has also been held that there is a danger of the intestines becoming strangulated by this band.

Fig. 127.

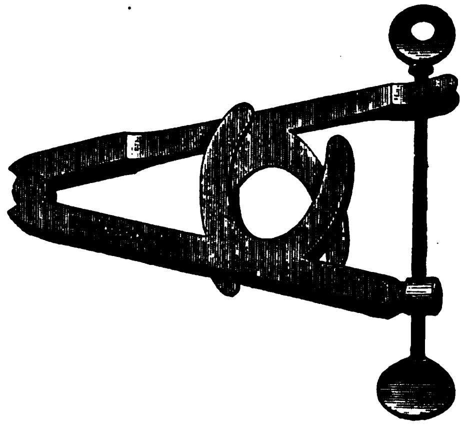


Wells's clamp for the pedicle.

Mr. Wells has modified, from time to time, the shape of the clamp, but Fig. 127 shows the one at present used by him, from which the handles can be detached, leaving but a ring around the stump of the pedicle. Koeberlé also uses a circular constrictor, or clamp, which acts very much on the same principle as the one used by Mr. Wells.

The instruments chiefly used in this country are Wells's, Thomas's, Dawson's, and Atlee's clamps, each having some special feature to recommend it. I prefer that of Dr. Thomas.

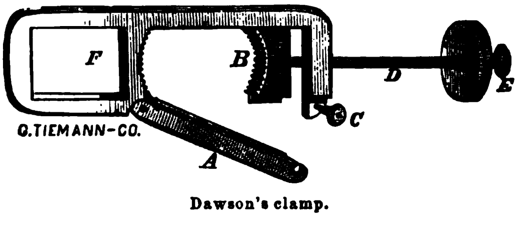
Fig. 128.



Thomas's clamp.

The use of the actual cautery at a red heat, for dividing the pedicle, was first practised by Mr. Baker Brown, of London; although to Mr. John Clay, of Birmingham, is due the credit of the conception, since he first employed the method for dividing adhesions. The practice is not now employed as formerly, and, to-day, it is chiefly advocated by Dr. Keith, of Edinburgh, Prof. White, of Buffalo, and, I believe, by Dr. Sims. As Dr. Keith has been successful in saving a larger proportion of his cases than any other operator in the world, this special mode of practice becomes entitled to a value which it would not otherwise possess. Mr. Baker Brown was obliged to resort frequently to the use of the ligature, although to the cautery was

Fig. 129.



Dawson's clamp.

given the credit of controlling the bleeding. What Dr. Keith's practice is in regard to the additional use of ligatures, I do not know. From a somewhat limited experience of the cautery I must confess to a feeling of mistrust as to its safety. But if the precaution be taken to tie separately the larger vessels, I believe that in many cases the use of the cautery for dividing the pedicle would prove an excellent mode of practice.

In the United States those who had operated the greater number of times were divided between the use of the ligature and the clamp. The late Dr. Atlee, who removed a larger number of ovarian tumors than any other operator in this country, almost always used the clamp; Dr. Peaslee, always the ligature; and, I believe, also Dr. Kimball, of Lowell. Dr. Thomas has a decided preference for the clamp, and Prof. White is the only one known to me now, in this country, who advocates the use of the cautery.

Whenever the cautery is employed, its value will rest upon the use of a temperature so far below white heat that the tissues can only be separated slowly, so that they may be changed in character for some distance beyond the actual contact of the iron. There will be no fear of sloughing, but this will alone insure the destruction of all but the largest sized bloodvessels, which must be ligated, as a rule.

In connection with the subject of securing the pedicle, reference must be made to Dr. H. R. Storer's "clamp shield," which is an excellent instrument to be used as a temporary clamp. For the removal of the uterus, or for securing tissues deep in the pelvis, we have no other device so well adapted.

There are certain conditions, viz., absence of the pedicle, too short a pedicle, and the existence of adhesions close to the attachment, which render it advisable to enucleate the tumor, as suggested[1] and first practised by Dr. J F. Miner, of Buffalo. In a case where the cyst was generally adherent, he succeeded in separating so extensively the layers of the cyst wall as to free the tumor.

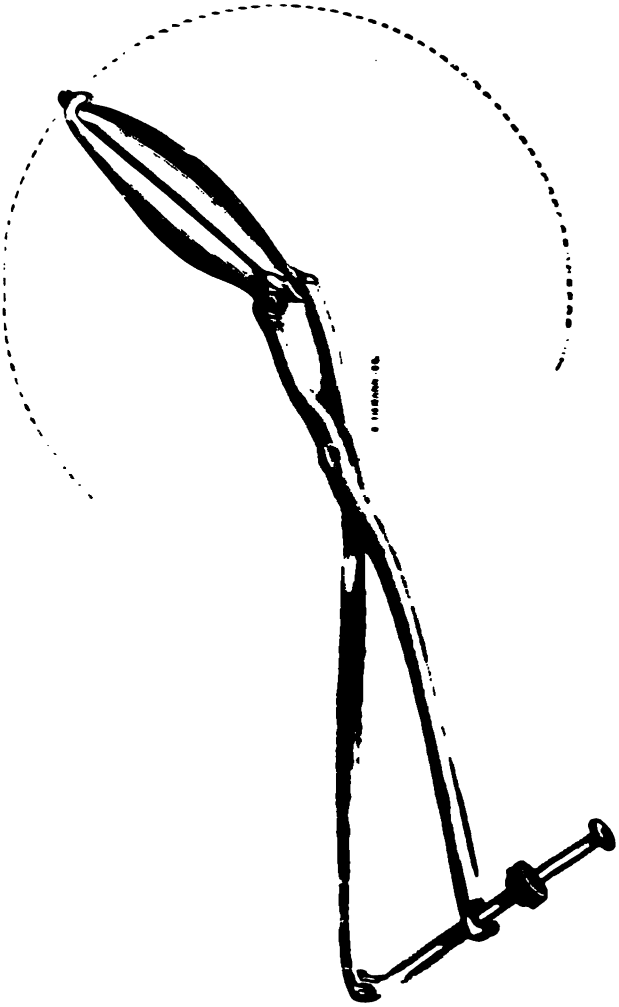
It is recommended to belt the tumor by a somewhat superficial incision at a distance from the pedicle, and then attempt to separate the tissues so as to loosen the tumor from its connection with the pedicle until it becomes free.

Dr. Miner states that "the pedicle was large and extended over a wide surface, but by gentle and patient efforts, it was separated from its entire attachment to the tumor, and the immense growth removed

[1] Buffalo Med. and Surg. Journ., June, 1869.

without the ligation of a single vessel. The terminal branches of the vessels of the pedicle gave out no more blood than issued from the vessels of the attachments elsewhere, and there appeared no more occasion for ligature here than elsewhere."

Fig. 130.



[illegible] clamp [illegible]

Dr. Miner has practised this method in a number of cases, as have Prof. James P. White, of Buffalo, and others. I have found, in some [illegible] the cyst walls in such a condition that no such separation could [illegible] while in others it could be accomplished with facility. I have never had a case in which it was necessary for me to follow this plan of enucleation.

During the meeting of the Obstetrical Section of the Am. Medical Association, in 1876, Dr. Alex. Dunlap, of Springfield, Ohio, proposed[1] what he called a division of the pedicle.

The tumor is first to be freed from all adhesions and lifted from its bed, and the pedicle secured in a temporary manner to prevent bleeding. Then a cut is to be made around the tumor, about half way through, and at such a distance that enough of the peritoneum may be saved to form a long pedicle. After doing this, the next step is to enucleate the tumor in the same manner as practised by Dr. Miner, of Buffalo. This leaves the bottom of the cup-shaped wound resting on the broad ligament of the uterus. He directed that, after securing the vessels, from five to six long loops of silk should be passed through the cut edge of the peritoneum, at equal distances. Then a curved metal speculum was to be introduced into the vagina to one side of the uterus, but never in front or behind it, and as the instrument was being pushed up against the bottom of the wound, a small opening was to be made.

Through this opening were to be passed into the vagina all the silk loops from the edge of the peritoneum, and the ligatures for securing the vessels, down through the speculum to the vaginal outlet. Then as traction was made on these loops, the detached peritoneum became inverted, and thus the raw surfaces were brought together in close contact.

By this method no discharge from the site of the pedicle could enter the peritoneal cavity, and the ligatures after becoming detached could be withdrawn through the vagina. Dr. Dunlap suggested that a similar plan might be followed in the removal of fibroid tumors.

This plan resembles in many respects the one adopted by Prof. Freund, of Breslau, by which he removed in five instances the uterus for cancer, two cases surviving the operation. I am unable to determine to whom the credit of priority is due for this method of inverting the peritoneum, and thus bringing together the denuded surfaces, and passing the ligatures through the vagina.

Prof. Freund also recommends the procedure for the removal of fibrous tumors. We will not enter into the merits of this operation for the removal of cancer of the uterus, or more than question if any permanent advantage, in this condition, can possibly be derived. But where a case has proved to be a fibrous tumor of the uterus, instead of an ovarian tumor, and it becomes necessary to complete the operation by removing the organ, the method may be followed with advantage, and the chances of recovery would be, in all probability, not altogether unfavorable.

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[1] Medical Record, July 8, 1876.

After a temporary ligature has been passed around the tumor to control the bleeding, it is recommended to tie the vessels in the broad ligament on each side. Then the mass may be removed and the stump of the uterus separated from the connective tissue about it, and freed from its attachment to the vagina. When this has been done the surfaces are all doubled on themselves, and drawn down by the ligatures to the opening into the vagina.

Then, to cut off all communication with the abdominal cavity above, the edges of the peritoneum and other tissues are brought together by a whip-stitch across the opening into the vagina.

A more extended description of this operation, with several diagrams, will be found in Mr. Wells's lecture, published in the *British Medical Journal*, July 27, 1878.

CHAPTER XLIII.

ABDOMINAL OVARIOTOMY.

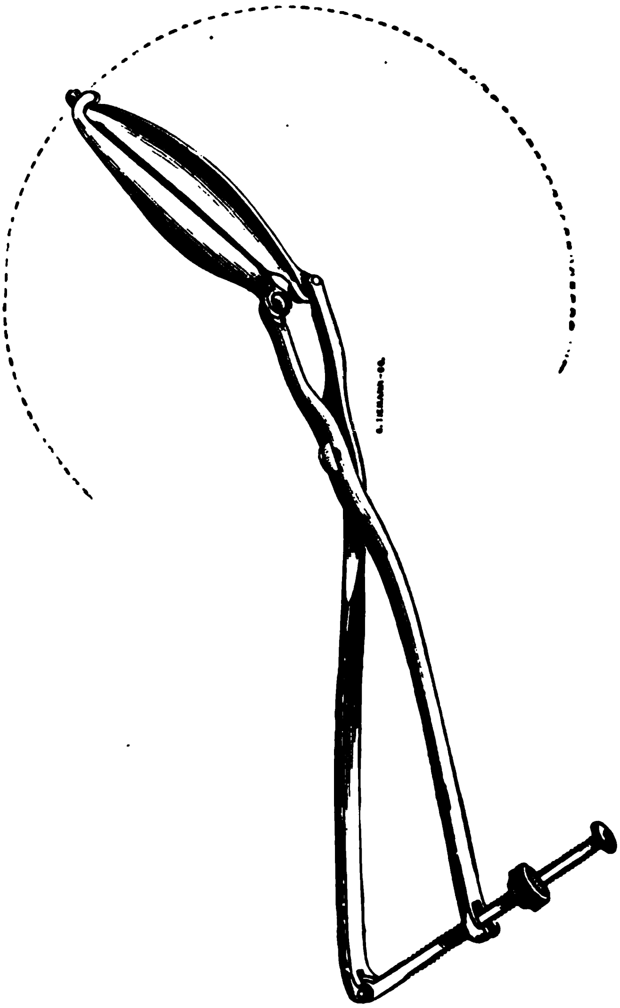
Steps of the operation—After-treatment: antiseptic dressings; closing of the incision; reduction of temperature (quinine, cold water applications, "fever cot").

Steps of the Operation.—The incision in the abdominal walls has sometimes been made through the muscles directly over the seat of the diseased ovary, but there seems to be no special advantage in this, and now it is almost always made in the linea alba. The location of this line can be easily traced by the eye from the symphysis pubis to the umbilicus, and frequently, in ovarian disease, a dark line in the skin marks the course of the linea alba beneath.

The first incision is to be made in this line, between the two recti muscles, about an equal distance from the umbilicus at one end, and from the pubes at the other. After cutting through the skin, the connective tissue, and a greater or less thickness of fat, the abdominal fascia will be brought into view, and this must be laid open on a grooved director, as the peritoneum is immediately below it. This in turn should be carefully opened by catching it up with a pair of forceps, snipping a small opening for the introduction of the grooved director, and then dividing it with a scalpel or scissors. The incision at first should not be more than three or four inches in length, and the progress of the operation should be slow, so that each bleeding vessel may be either tied, or secured by a pair of forceps before opening the peritoneal cavity. As soon as the surface of the sac has been exposed, it will be readily recognized, while yet moist, as has been stated, from its peculiar pearl-like hue. Whenever it is dark and vascular from being covered with unusually large vessels, this is generally indicative of a fibro-cystic tumor of the uterus.

When the sac has become firmly adherent to the abdominal walls, it is sometimes impossible to recognize the peritoneum. In the attempt to separate the supposed adhesions, this membrane may be exclusively torn off from the muscular tissue, and there may be considerable hemorrhage before the true condition is detected. This may lead to without the ligation of a single vessel. The terminal branches of the vessels of the pedicle gave out no more blood than issued from the vessels of the attachment elsewhere, and there appeared no more occasion for ligature here than elsewhere."

Fig. 130.



Storer's clamp shield.

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[1] Medical Record, July 8, 1876.

After a temporary ligature has been passed around the tumor to control the bleeding, it is recommended to tie the vessels in the broad ligament on each side. Then the mass may be removed and the stump of the uterus separated from the connective tissue about it, and freed from its attachment to the vagina. When this has been done the surfaces are all doubled on themselves, and drawn down by the ligatures to the opening into the vagina.

Then, to cut off all communication with the abdominal cavity above, the edges of the peritoneum and other tissues are brought together by a whip-stitch across the opening into the vagina.

A more extended description of this operation, with several diagrams, will be found in Mr. Wells's lecture, published in the *British Medical Journal*, July 27, 1878.

CHAPTER XLIII.

ABDOMINAL OVARIOTOMY.

Steps of the operation—After-treatment: antiseptic dressings; closing of the incision; reduction of temperature (quinine, cold water applications, "fever cot").

Steps of the Operation.—The incision in the abdominal walls has sometimes been made through the muscles directly over the seat of the diseased ovary, but there seems to be no special advantage in this, and now it is almost always made in the linea alba. The location of this line can be easily traced by the eye from the symphysis pubis to the umbilicus, and frequently, in ovarian disease, a dark line in the skin marks the course of the linea alba beneath.

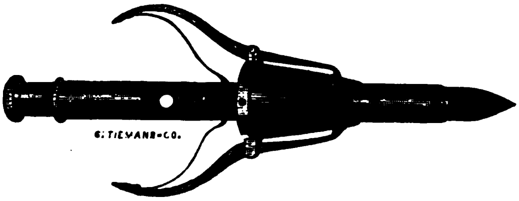
The first incision is to be made in this line, between the two recti muscles, about an equal distance from the umbilicus at one end, and from the pubes at the other. After cutting through the skin, the connective tissue, and a greater or less thickness of fat, the abdominal fascia will be brought into view, and this must be laid open on a grooved director, as the peritoneum is immediately below it. This in turn should be carefully opened by catching it up with a pair of forceps, snipping a small opening for the introduction of the grooved director, and then dividing it with a scalpel or scissors. The incision at first should not be more than three or four inches in length, and the progress of the operation should be slow, so that each bleeding vessel may be either tied, or secured by a pair of forceps before opening the peritoneal cavity. As soon as the surface of the sac has been exposed, it will be readily recognized, while yet moist, as has been stated, from its peculiar pearl-like hue. Whenever it is dark and vascular from being covered with unusually large vessels, this is generally indicative of a fibro-cystic tumor of the uterus.

When the sac has become firmly adherent to the abdominal walls, it is sometimes impossible to recognize the peritoneum. In the attempt to separate the supposed adhesions, this membrane may be exclusively torn off from the muscular tissue, and there may be considerable hemorrhage before the true condition is detected. This may lead to much trouble afterwards, and to avoid it we must proceed with care until the tumor has been reached, and even if it be punctured by accident it can be safely emptied before the adhesions are broken up.

Under ordinary circumstances it is desirable to have some idea in regard to the extent of adhesions before evacuating the contents of the tumor. This is ascertained by introducing, through the small abdominal incision, a large steel sound, as made for the male urethra, or a block-tin rod (which I prefer), the instrument being carefully passed in every direction over the surface of the tumor. If it is evident that adhesions exist to any extent, it will be necessary to introduce, between the tumor and abdominal walls, two fingers as a guide, and with a pair of scissors extend the incision, passing upwards to the left of the umbilicus, or beyond, if necessary, and downwards to the pubes, care being taken to avoid injuring the bladder.

Trocars of various forms have been devised for drawing off the contents of the sac. Wells's trocar is much used. It has an arrangement for seizing the walls of the cyst and drawing it out as it becomes emptied. Fitch's "dome trocar" has been enlarged for this purpose; its principle admirably fits it for tapping the cavity of the pleura or pericardium without wounding the lungs or heart, but it possesses no special advantage for emptying an ovarian cyst which is exposed to view. I prefer a simple curved trocar and canula about five or six inches in length, which I had made many years ago, and still continue to use (see Fig. 132.)

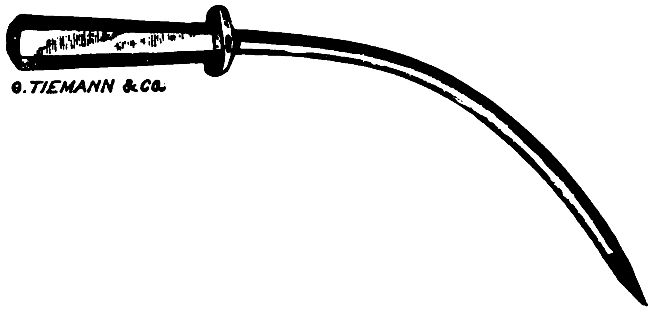
Fig. 131.



Wells's trocar.

The operator will select some point free from bloodvessels, in the largest sac (if there be more than one), through which to plunge the trocar and canula. Unless the tumor is free from adhesion, so that it can be drawn out to prevent the escape of fluid into the abdominal cavity, it should be tapped with the patient on her side, as first recommended by Mr. Wells. The patient can be turned well over on the side, and be thus held by the assistants, while the operator gradually draws out the sac by means of any strong forceps or vulsellum constructed for the purpose. A linen cloth must be placed under the tumor and over the lower edge of the wound, to receive any cystic fluid which might by accident escape alongside of the canula, otherwise it may enter the abdominal cavity. As the abdominal walls become more relaxed, the upper edge of the incision should also be covered by a linen cloth to protect the parts, and to keep the hand of the assistant from coming in direct contact with the intestines, which are liable to protrude.

Fig. 132.



Emmet's trocar.

The most frequent seat of the adhesions is to the abdominal walls, and next to the omentum, covering the anterior surface of the cyst. They may be found in both places.

Great care and skill are required to separate the adhesions between the tumor and the abdominal walls. This separation must be made, as has been stated, by tearing off the adhesions from the surface of the tumor, and never from the abdominal wall, as this would leave the muscular tissue exposed without any peritoneal covering, which would delay and complicate the progress of the operation. But when the adhesions are separated from the surface of the tumor, it rarely happens that any large bloodvessels are lacerated, and what capillaries are torn will promptly close up.

If the omentum, as indicated by its appearance, is found to be adherent to the tumor at the abdominal opening, more care must be exercised in making traction, through fear of tearing the connection of the omentum with the intestine beyond. It is not necessary to delay for the purpose of attempting to separate the omentum from the surface of the tumor, but just beyond the adhesions two ligatures may be placed an inch apart, around the mass, which may then be divided between the ligatures with a pair of scissors. This will prevent any bleeding from the tumor, and the ligature from the end attached to the omentum should be placed in charge of an assistant while the stump is temporarily returned to the abdominal cavity.

Adhesions are sometimes formed with the under surface of the liver, and to the stomach and small intestines. If these are carelessly broken up, the substance of the viscera may be torn, and fatal results follow. When slight they may be separated from the surface of the tumor; but the safest plan is to cut around the adhesions so as to leave the adherent part of the cyst wall intact, and then carefully strip off the portion of lining membrane. If a vessel be divided it must be secured with a fine silk ligature.

Dr. Peaslee states that adhesions to the stomach are never found, although Kiwisch admits them. After Dr. Peaslee wrote his work, however, he was present at an operation begun by me in the Woman's Hospital, in which both the stomach and transverse colon were adherent to the surface of the tumor, as I have described when treating of the injections of iodine into the sac.

After one cyst has been emptied, the hand may be introduced into it for the purpose of breaking down the partition walls, so that the contents of all the cysts may escape by one common outlet; or each cyst may, in turn, be emptied by a trocar as it presents. When the tumor has been thus sufficiently reduced in size to be drawn out of the abdominal cavity, it should be wrapped up in a towel to preserve its warmth and circulation until the pedicle can be divided. The patient is then to be turned on her back, the abdominal incision held open, so that the small intestines and the parts of the pedicle may be covered by pieces of linen cloth wrung out of warm water to which carbolic acid has been added. This will protect the intestines from cold and from the continued action of the spray, and will absorb any blood which oozes from the walls, or from the pedicle after it has been divided.

A clamp or a strong cord should next be passed around the pedicle, close to the tumor, for a temporary ligature, and the mass divided with a pair of scissors at a safe distance from the constricted point. As the tumor is held up by the assistant, that the cord may be applied, he should not make any traction.

CASE LXIII.—I lost a patient in the Woman's Hospital for want of care in this respect. The operation had been a very satisfactory one, and I did not know that undue traction was made by my assistant as

I applied the ligature. Shortly after the patient recovered from the effects of the ether, symptoms of loss of blood presented themselves with increasing urgency. The cause was so obvious that I opened the lower angle of the wound, expecting to find hemorrhage from the stump of the pedicle, but on passing a sponge probang down into Douglas's cul-de-sac it was evident that the cavity was even unusually free from bloody serum. I was unable to account for the condition, and death took place in a few hours. A post-mortem examination disclosed a thrombus in the connective tissue under the fascia, which dissected up the pelvic tissue, and extended beyond the left kidney. Some vessel in the cellular tissue under the pedicle had been ruptured, several quarts of blood were lost, causing intense suffering to the patient by pressure on the ureter and kidney, and from which she could not be relieved even when stupefied with opium.

After cutting away the tumor and ascertaining that there is no bleeding from the stump, it may be temporarily dropped back into the cavity, the long ends of the ligature being held by an assistant. The tumor being out of the way, a careful inspection must be made to ascertain that no bleeding is taking place from the abdominal walls or from vessels which may have been ligated. Fresh linen cloths, which have been wet in the warm solution of carbolic acid and wrung out nearly dry, may be again spread out over the small intestines to protect them from the chilling effect of the spray, and those over the edges of the incision and peritoneum on the abdominal wall may be changed.

If the clothing or covering of the patient should have become wet from the escape of the contents of the tumor, they must be removed or rolled up, and dry warm towels laid next to the skin.

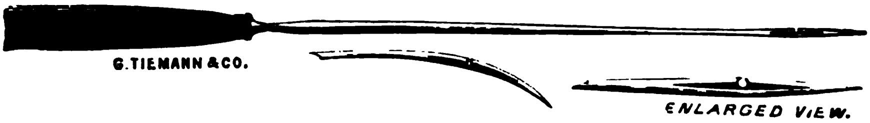
The pedicle may now be finally secured. If a clamp is to be used, the temporary one, which may have been applied instead of a ligature, need not necessarily be removed. If the pedicle is to be ligated, an assistant must lift up the free end of the stump with a tenaculum or by the clamp, if one has been applied, making as little traction as possible. As the stump is held up, the operator will be able to select a point free from bloodvessels through which to pass a needle carrying a double thread forming a loop. By this loop the silk ligature is to be drawn through in two portions of equal length. Unless the pedicle is of unusual thickness, it will be sufficient to tie it in two sections. After cutting the silk so as to make two ligatures, one must be passed around the other so that when they are tied they will be linked together, and not lie independent of each other. If this is not done the pedicle will be apt to split from the point at which the ligatures were passed and give rise to hemorrhage. The ends of the ligatures should be tied at first only in a half-knot on each side, but securely enough to compress the tissues as much as the strength of the silk will permit. Then as the stump of the pedicle is held up with a tenaculum in the hands of an assistant, the temporary ligature should be cut away or the clamp loosened. But before this is done a cloth or sponge must be placed about the pedicle to absorb what blood may escape. The quantity of blood escaping will be small if a half-knot has been already made on each side, for it will require but a second of time for the operator to tighten the first half, and then complete what is called a square knot by the addition of a half-knot afterwards.

It is always well thus to loosen the temporary ligature before securing the permanent one, so as to admit of the escape of blood included between the two ligatures, or hemorrhage may afterwards occur. Until the condition of the other ovary has been examined, an assistant will continue to hold the end of the pedicle with a tenaculum, and never by the ends of the ligatures. If the other ovary be found diseased, a double ligature must be passed through its pedicle in the manner just described, and it must be also removed. The ends of all the ligatures are to be cut off as close to the knot as can be done with safety, and the stump of the pedicle then trimmed of all ragged portions not nearer to the ligatures than one inch. The ends of the remaining ligatures in charge of the assistant are in turn to be cut off close, after it has been seen that all bleeding has been arrested by them. All blood-clots are to be removed, and Douglas's cul-de-sac emptied of the fluid which may have gravitated into it. To do this the left hand is to be passed down close to the uterus, with the palm towards the intestines, to push them back, when the sponge probang can be easily passed to the bottom of the cavity. After the cul-de-sac has been emptied a fine, clean, surgical sponge, with a string attached, may be introduced to the bottom of the pouch and left there, with the string outside in charge of an assistant. The linen cloths which had been placed over the small intestines should now be changed for a fresh one, and those over the edges of the abdominal incision are to be removed for the purpose of closing the cavity.

I have met with several instances of umbilical hernia, in connection with ovarian tumors. The first instance coming under my observation was seen by the late Dr. Peaslee in consultation, in 1868, where the ring was dilated sufficiently to admit two fingers. In this case, as in the others, I extended the abdominal section to one side and removed the whole umbilical ring, with a pair of scissors, uniting the entire incision in the abdominal wall in one common line.

Metallic sutures are now generally employed for this purpose. Mr. Wells, however, uses silk. These sutures may be introduced by one of three methods. The most common is by the aid of an awl-shaped instrument, like Dr. Skene's straight needle, or the curved one of Dr. Peaslee, for closing a ruptured perineum.

Fig. 133.



Skene's needle or ruptured perineum.

Near the point of the instrument is an eye through which a loop of thread is inserted. While the instrument is being passed through the tissues the two ends of the loop are to be grasped with the handle and held until the eye, with the thread, has passed through both flaps. After having passed through one flap, the other is to be adjusted in proper relation to the point of the instrument, to secure a perfect coaptation. The wire is now to be attached to the loop of the thread and pulled through the two flaps as the needle is withdrawn.

I am in the habit of using for this purpose a straight thick sewing needle, about two inches long, armed with a loop of thread of a sufficient length, to which the wire has been already attached, and the needle is passed by means of the needle forceps in the following manner: The operator catches up one flap between his thumb and fingers, and forces the needle through the tissues, making the point of exit about an inch from the margin.

Then the opposite lip of the incision is seized in the same manner, and turned out a little, so as to expose the peritoneal surface, that the point of the needle may be introduced at a distance corresponding to its exit from the other flap.

It is advisable to bring together in this manner a broad strip of the peritoneum, whenever it can be done. The peritoneal surfaces will adhere in a few hours, when held in close contact, and prevent pus, or other fluid, passing from the wound into the abdominal cavity. The sutures are to be introduced somewhat in reference to the thickness of the parietes, for should they be thick, unfortunately only a limited portion of the peritoneal surfaces can be brought up in contact by them. The points at which the sutures emerge from the flaps should lie nearer the edges of the incision on the skin surface than they do on the peritoneal surface, because this secures a better coaptation.

I have sometimes attached a needle to each end of a piece of silver wire and passed them through the tissues from within outwards.

When the operator has introduced a suture through the flaps it is to be transferred to the assistant, who should regulate the proper length, and bring together the sides of the incision, by a twist or two of the wire, while the next suture is being passed. The sutures are to be introduced from above downward, a distance of half an inch apart, until all have been passed; but a sufficient number are to be left untwisted at the lower angle of the wound, so as to allow of the removal of the linen cloth spread over the small intestines, and of the sponge which had been left in Douglas's pouch. It will be necessary to pass several fingers between the flaps, down to the sponge, to keep back the intestines while the sponge is being removed. After its removal a sponge probang should be introduced before withdrawing the fingers, to insure that the cul-de-sac has been thoroughly emptied.

If the pedicle has been secured by a clamp, it must now be placed at the lower angle of the wound to be held there until all the sutures have been secured. Whenever the adhesions have been extensive it is advisable to introduce a drainage tube to the bottom of Douglas's cul-de-sac before the fingers are withdrawn. The assistant should hold it in the lower third of the incision, until all the sutures have been secured. I always require the third assistant to continue the lateral pressure with the palms of his hands spread out over the sides of the abdomen, until the bandage is to be applied, as this controls the oozing by keeping the side of the abdominal wall in close contact with the intestines. Whenever the abdominal parietes are much relaxed, an assistant can keep the peritoneal surfaces bordering on the incision in close contact during the introduction of the sutures. Another advantage of this pressure is that it affords a support, and closes the cavity against the entrance into it of blood from the peritoneal surface, or from the punctures of the needles.

It is advisable to discontinue gradually the inhalation of the ether towards the close of the operation, so that the patient may even be somewhat conscious of the introduction of the last sutures. The final adjustment of the sutures will require some care, that they may not prove a source of irritation. They are to be twisted as when used internally, and after having been bent over flat to the surface of the skin, in the manner directed in the chapter on the use of the silver suture, their ends are to be cut to about half an inch in length.

Throughout the whole progress of the operation the spray should be properly directed, and the open abdominal cavity should be at no time exposed. When the operation has been prolonged, and the spray apparatus is known to be nearly empty, either of water or alcohol, the instrument in reserve must be prepared, and be in good working order over the wound before the other is withdrawn. If, for any cause, there should be an interruption in the action of the spray, the abdomen must be immediately covered with several thicknesses of the gauze cloth, wet with the weakest solution of the carbolic acid, to be uncovered only when the spray is again in operation.

If there is any advantage in the antiseptic method, it can only be secured by observing scrupulously the minutest details. Perhaps in private practice, and under some other favorable circumstances, there may be apparently little advantage in it, but in hospital practice, its advantage cannot be questioned.

The spray is to be continued until the bandage has been adjusted. After having sponged off the surface of the abdomen, a piece of "protective," about two inches wide, and wet with the weakest carbolic solution, is to be laid directly over the wound, a hole having been made in it for the drainage tube. Over this, and covering a large portion of the abdomen, is to be spread a single thickness of the gauze cloth also wet with the same solution; then a sufficient quantity of the dry gauze cloth folded into about eight or ten thicknesses, and large enough to reach from the pubes to the ensiform cartilage, and from one crest of the ilium to the other. Between the outer folds, a somewhat smaller piece of the mackintosh is to be spread with the rubber surface downward. Finally, under the patient must be spread a piece of muslin the size of an obstetrical binder, and split up from each end into a number of tails. These are to cross over the abdomen, interlacing like a many-tailed bandage, and the ends are to be pinned so as to maintain an equable degree of pressure. The spray may now be discontinued, but it will be necessary before completing the dressing to stuff in around the edges of the bandage, about the pubes and ribs, a sufficient quantity of carbolized jute to fill in the spaces. This method, obtained from Dr. Weir, is essentially the one which Mr. Lister has adopted in general surgical practice.

Mr. Wells in his third lecture[1] describes his mode of applying this dressing in the following manner. "The last thing I have tried seems to me to answer better than anything. It is gauze saturated with thymol, the last substitute for carbolic acid. Thymol and spermaceti are mixed together. The gauze is charged with it, and makes a very nice soft antiseptic dressing, which is simply put over the united wound. Eight or ten other folds are put over first, and then you support the whole with strips of plaster, and the flannel bandage (lined with linen or calico to lessen the irritating action of the flannel on the skin of the patient), and this bandage is tightly fastened over the gauze with safety pins."

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[1] Brit. Med. Jour., July 6, 1878.

Whenever it becomes necessary to disturb this dressing, it must be changed under the spray, with as much care as was exercised during the progress of the operation.

After-Treatment.—As a large proportion of the deaths from ovariotomy are due to shock, special attention should be directed to bringing about a reaction immediately after the operation. Heat should be applied to the patient's body, no matter what the season of the year, and she should be left quiet, in a well-ventilated room, of which the temperature is to be maintained at about 65° F. Very little else need be done unless symptoms of prostration should appear, when it may be necessary to give brandy hypodermically or by the rectum until it can be retained by the stomach. Beef-tea may also be given with the brandy by the rectum if indicated, a towel being held by the nurse firmly against the anus to prevent its expulsion should a paroxysm of vomiting come on. Hypodermic stimulation is, however, to be resorted to only when immediate effects are demanded, as it not infrequently gives rise to abscesses.

To allay the distressing vomiting which sometimes continues after the ether is withdrawn, a mustard plaster should be placed over the stomach before the patient becomes conscious. Small fragments of ice may be given, and perhaps a little carbolic acid water or champagne if needed. Dr. Keith recommends the sipping of hot water, and it is sometimes very efficient. If the nausea and vomiting are not quieted within a reasonable time, it may become necessary to administer a hypodermic injection of morphia to prevent too great a loss of strength.

After reaction has been established, the stomach should remain at rest for two or three days, having nothing put into it beyond a little cracked ice, and occasionally a spoonful of milk, with as much limewater. All the nourishment should be given by the rectum, and with as little disturbance as possible. Dr. Keith gives no food at all until flatus has begun to escape from the anus; and Dr. Charles Clay, of

Manchester, advises that no solid food be given until the patient asks for it.

At any time after the first twenty-four hours, and within a week from the time of the operation, there may be an elevation of temperature and an increase of pulse. Following these, if the progress is unfavorable, there may occur vomiting, pain over the abdomen, and tympanites, and later, diarrhœ́a of a most offensive character. These are the initial symptoms of peritonitis, and they may be followed in a short time by symptoms of septicæmia, and, later, of pyæmia. It is a question yet to be settled, whether septicæmia is not at the bottom of this unfavorable change. A certain amount of bloody and serous oozing always takes place when adhesions are broken up during the operation. Frequently this is promptly absorbed without producing the slightest disturbance; but, under some unknown circumstances, it is absorbed very slowly, and in a few hours may undergo septic changes, and poison the whole mass of the blood. To secure the safe removal of this "oozed" fluid, and to keep down the patient's temperature, is one of the problems of this branch of surgery. The reduction of temperature does not insure the removal of the blood poison, but it renders the condition of the patient less critical. The higher the temperature above the normal, the greater will be the tissue waste, and the more seriously will the action of the kidneys and other excretory organs be impaired, even to the extent of total arrest, and of course, death. An increased action of the kidneys, skin, and other excretory organs is essential when blood-poisoning exists. A reduction of the temperature to the normal (that is, when it is not brought about by exhaustion) favors functional activity, and secures a more rapid elimination of septic material, and affords time for the institution of remedial measures.

Among the so-called antipyretics quinine is the only one which is worthy of confidence. In hospital practice it is advisable to prepare the patient by getting her moderately under the influence of this agent several days before the operation. This may be kept up afterwards by the daily use in small quantities; but should the necessity occur, from an elevation of temperature, the quinine must be then given in large doses to produce a marked effect. When the stomach is in too irritable a condition to retain it, the quinine in solution may sometimes be administered with advantage by means of the hypodermic syringe. The rectum should also be employed, under the circumstances, but the absorbing power of its mucous membrane is too slight to enable us to expect great results from the introduction of remedies in that direction. The external application of cold, dry or wet, has, from time to time, been highly extolled for the reduction of temperature, but hitherto the difficulties in the way of its application have greatly limited its use.

Dr. Richardson seems to have been the first ovariotomist who employed cold, by means of an ice-bag about the neck, with a view of directly lowering the temperature of the blood going to the brain and nerve centres. But his method was crude and inconvenient, and it proved impossible to keep the ice-bag in position.

At length, Mr. J. K. Thornton, of London, suggested an improved ice-cap in the form of a coil of small India-rubber tubing, through which a constant current of ice-water was made to flow. This arrangement has met with Mr. Wells's entire approval, and he states[1] that "it is very seldom that within an hour the effect upon the patient cannot be distinctly proved by the thermometer, and I believe in many cases it has been of very signal service."

Yet it is evident that, for speedily reducing the temperature of the whole body, the application of cold to the head alone is limiting it to too small an area, although my own experience does not extend beyond the use of the cold cap and sponging of the face and extremities. To Dr. T. G. Thomas we are indebted for information as to the most effective means[2] for applying cold to the body, and from it we are promised an advance in ovariotomy second only in importance to that made by the introduction of "Listerizing."

Dr. Thomas has used at the Woman's Hospital the "fever-cot" of the late Dr. G. W. Kibbee, who died in the discharge of his duty, as a volunteer, during the recent (1878) epidemic of yellow fever in New Orleans, where he was experimenting with his cot in the treatment of that disease.

The "fever-cot" is essentially the same as the low, narrow and folding cot so commonly used as a temporary bed. A strong elastic cotton netting is substituted for the stretched canvas, and beneath this, for the whole length, and from one side to the other, hangs a piece of rubber cloth. The water readily runs through this netting to the rubber cloth below, which, hanging loose, forms a gutter, and conveys the water to a bucket, or other receptacle, at the foot of the bed.

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[1] Fifth lecture, Brit. Med. Journ., July 13, 1878.

[2] The most effectual method for controlling the high temperature occurring during ovariotomy, New York Med. Journ., August, 1878.

The following is Dr. Thomas's description of his method.

"Upon this cot a folded blanket is laid so as to protect the patient's body from cutting by the cords of the netting, and at one end is placed a pillow covered with India-rubber cloth, and a folded sheet is laid across the middle of the cot about two-thirds of its extent. Upon this the patient is now laid, her clothing is lifted up to the armpits, and the body enveloped by the folded sheet, which extends from the axillæ to a little below the trochanters. The legs are covered by flannel drawers, and the feet by warm woollen stockings, and against the soles of the latter bottles of warm water are placed. Two blankets are then placed over her, and the application of water is made. Turning the blankets down below the pelvis, the physician now takes a large pitcher of water at from 75° to 80° and pours it gently over the sheet. This it saturates, and then, percolating the network, it is caught by the India-rubber apron beneath, and, running down the gutter formed by this is received in a tub placed at its extremity for that purpose. Water at higher or lower degrees of heat than this may be used. As a rule, it is better to begin with a high temperature, 85° or even 90°, and gradually diminish it.

"The patient now lies in a thoroughly soaked sheet with warm bottles to her feet, and is covered up carefully with dry blankets. Neither the portion of the thorax above the shoulders nor the inferior extremities are wet at all. The water is applied only to the trunk. The first effect of the affusion is often to elevate the temperature, a fact noticed by Currie himself; but the next affusion, practised at the end of an hour, pretty surely brings it down. It is better to pour water at a moderate degree of coldness over the surface for ten or fifteen minutes than to pour a colder fluid for a shorter time. The water slowly poured robs the body of heat more surely than when used in the other way. The water collected in the tub at the foot of the bed, having passed over the body, is usually 8° or 10° warmer than it was when poured from the pitcher. On one occasion Dr. Van Vorst, my assistant, tells me that it had gained 12°.

"At the end of every hour the result of the affusion is tested by the thermometer; and, if the temperature has not fallen, another affusion is practised, and this is kept up until the temperature comes down to 100° or even less.

"It must be appreciated that the patient lies constantly in a cold wet sheet; but this never becomes a fomentation, for the reason that as soon as it abstracts from the body sufficient heat to do so, it is again wet with cold water and goes on still with its work of heat abstraction. I have kept patients upon this cot enveloped in the wet sheet for two and three weeks, without discomfort to them, and with the most marked control over the degree of animal heat. Ordinarily after the temperature has come down to 99° or 100°, four or five hours will pass before affusion again becomes necessary."

"Recognizing in this a method by which cold could be applied to the surface for any length of time without fatigue or exhaustion to the patient, and without the danger of excessive chilling, since any great depression of temperature can be obviated by the affusion of warm water, I determined at once to adopt it after ovariotomy."

Dr. Thomas has given the history of eight cases treated by this method, and the fact is clearly established by these records that the rise in temperature can be kept under control.

The reduction of temperature is all very well, so far as it goes, but the patient will die in spite of it, unless the decomposing bloody serum is removed from the peritoneal cavity.

If a drainage tube has been left, communicating through the abdominal incision with Douglas's cul-de-sac, it can be ascertained if an accumulation of fluid has taken place there. This tube should be kept well corked until symptoms of blood-poisoning arise, when it is to be opened frequently to admit of the escape of any fluid that may be in the cavity; and a hard rubber syringe with a long narrow nozzle tipped with an inch or so of small tubing perforated with one or more small holes, should be passed to the bottom of the drainage tube to remove what has not run out. Afterwards a weak solution of carbolic acid in warm water should be injected with the greatest care, and continued until the fluid begins to return through the tube, when it is to be drawn out with the syringe, and the injection repeated until the water runs clear. This must be done as often as may be indicated, for when the quantity is great it may be necessary, in some cases, to wash out the cavity every hour or two, while in others, twice in the twenty-four hours will be sufficient.

A cup sponge, which has been saturated with a solution of carbolic acid, can be kept over the mouth of the drainage tube after the first dressing. If any portion of the bandage is found wet and soiled by the discharge, or any odor can be detected, the dressing must be changed, and always under the spray.

The final removal of this drainage tube will depend on circumstances, but it should be withdrawn in five or six days if possible. It soon becomes surrounded by lymph, which forms a canal to the bottom of Douglas's cul-de-sac, and the pressure of the glass tube is more or less irritating, and excites a discharge which would not otherwise take place. After the fourth day, if it cannot be dispensed with, a shorter glass tube, or a piece of rubber tubing, should be used, the size to be reduced from day to day both as to length and diameter. To prevent the tubing from slipping into the abdominal cavity, a loop of thread should be fastened to its outer end. When no drainage tube has been used, and symptoms of blood-poisoning come on, the lowest angle of the wound must be opened, under the spray, with a probe, and the position of the patient changed to aid the escape of any fluid in the cavity. A vaginal examination must also be made, and if any fluid can be detected in Douglas's pouch, it must be at once evacuated by puncture.

The tympanites which always exists more or less, in even the most favorable cases, can be only palliated if excessive. Ten or twenty drops of chloroform, with as many grains of powdered camphor dissolved in it, and administered in a little gum-water, will sometimes give relief when the stomach is sufficiently quiet to tolerate any remedy. The application of dry heat to the abdomen is always grateful, and frequently the only relief which can be gained is through changing the patient's position. This can be done without much disturbance, by lifting one side of the mattress, and placing a pillow under it; this will shift the position of the patient sufficiently to one side to give temporary relief.

The catheter should be introduced for four or five days, after which it will be safe to move the patient sufficiently to use the bed-pan. It is scarcely ever necessary to cause the bowels to act before the end of the first week, and then it is better to employ an enema of warm water, and a little Castile soap for the purpose.

I feel fully satisfied, from my own observation, that much harm has been done by the indiscriminate use of opium after ovariotomy. Under some circumstances the effect of opium seems to increase the action of the kidneys, but, as a rule, its secondary effect, if not its primary one, is to diminish the secretion, particularly of the skin. Opium is unquestionably a valuable remedy, and should be used without hesitation when needed. It often serves to economize the patient's strength by allaying pain, and by producing sleep. Its use is also essential to hold in check the early vomiting of peritonitis, but it should never be used as a prophylaxis against its occurrence. The plan so often followed of giving large doses of opium from the beginning, and of keeping the patient fully under its influence, has killed a great number by arresting the secreting or eliminating processes.

As long as the patient seems to be doing well, the bandage ought not to be disturbed until the sutures are to removed, which, if they are of silk, ought to be in four or five days, and if metallic, at the end of one week. When the course of the convalescence has been favorable, the patient is generally able to sit up for a short time at the end of the second week, and in from four to six weeks she may be able to return home. She should continue to use an abdominal bandage for several. months after the operation. This will give support to the tissues which have been so long overstretched, and will at the same time guard against a separation along the line of incision, and the occurrence of a hernia.

We cannot conclude this subject in a more appropriate manner than by presenting to the reader, the latest views of Mr. Wells and Dr. Keith regarding the antiseptic mode of treatment.

Mr. Wells has stated in one of his lectures, "I think I have already noticed a considerable difference in the progress of cases after operation since I began to use carbolic acid and thymol. There has distinctly been less elevation of temperature in every one of the cases than I have ever, or only exceptionally, seen before. I may say that, in antiseptic ovariotomy, fever is the exception, when as formerly it was the rule."

Mr. Wells, in addition, states that in his hospital practice, for the past two years, he had had ninety per cent. of recoveries.

Dr. Keith's success in this operation had been unequalled previous to employing Lister's method, and the effect of its adoption and the advantage gained cannot be better expressed than in his own words.[1] "Without antiseptics, my results over fourteen years gave a mortality of almost 1 in 7. Of the five years preceding the use of the spray, nearly 1 in 10½, of the last of these five years 1 in 21. To what then are these results to be attributed?" He attributes this success first to the use of the drainage tube, which has been described, and states, "I am as certain as I am of my existence, that, had I used them earlier and oftener, the mortality would have been less by one-third." He next rates in value the use of the cautery in dividing the pedicle; then the compression forceps in large numbers to prevent loss of blood; and finally the substitution of ether for chloroform. "All these things have, I think, helped to lessen the mortality, but the drainage and the employment of the cautery in the division of the pedicle, have contributed most."

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[1] Results of Ovariotomy before and after Antiseptics, by T. Keith, F.R.C.S., Edinburgh, British Medical Journal, Oct. 19, 1878.

"What then have we gained by antiseptics in ovariotomy? 1. It has lessened the mortality. Take the results of the German surgeons, After the first trials even, the mortality fell at once from 50 per cent. to 20: thirty lives saved by the spray alone, out of every hundred. When I add that my last forty-one have all recovered, enough has been said. No such successful series was ever got in the old way."

"2. This increased safety will encourage medical men to recommend earlier operations, which certainly few of them now do. That very large tumors and bad adhesions increase the mortality there can be no doubt. For the last seven years, no death happened to me in non-adherent tumors, and the deaths that occurred during that period were, with a single exception, in cases where the local difficulties prolonged the operation for two hours or more. Certainly early operations, when a cyst bursts, and fluid is thrown out in a large quantity into the peritoneum, cannot be too strongly urged. 3. With antiseptic ovariotomy, the drainage tube will not be nearly so often required. I do not think that it can be altogether dispensed with. No one has practised drainage so much as I have, yet I know well that it sometimes cannot be used without risk." "With antiseptics the tube can be removed much earlier." 4. "Convalescence is rendered easier. 5. Antiseptics are a great comfort and relief to the operator. Speaking for myself, the difference is enormous; ovariotomy is not the operation it was fifteen or sixteen years ago, or even two years ago." "This long-despised operation is now the safest of all the great surgical operations, at least judging from the results, twelve deaths of the last one hundred and fifty-six, three of the last seventy-five, and no deaths of the last forty-one operations."

While on a visit to Edinburgh during the past summer, Dr. Keith informed the author that he had then operated sixty-six times without a death. In the medical journals it has been stated that the number since had reached seventy cases with the same result.

At a meeting of the Royal Medical and Chirurgical Society (*London Lancet*, Nov. 15, 1879), Mr. Tait presented a case of Gastrotomy, and in the discussion he called on Mr. Spencer Wells for his experience of ovariotomy before and after the adoption of antiseptics. Mr. Wells stated that since he had adopted their use, six deaths had occurred in eighty-one cases, while in the series of cases just previous the mortality had been about ten per cent. He attributed so marked an advance to the antiseptic method and not to greater experience and care.

In a recent letter to the author, Mr. J. Knowsley Thornton stated that he had then performed forty-six ovariotomies with but two deaths, one of cancer, and the other of shock a few moments after the completion of the operation.

Speigelberg has operated thirty-five times in hospital practice, under the antiseptic method, with a loss of fourteen per cent., while previous to using the carbolic spray he lost, after forty-five operations, twenty cases or forty-five per cent. of deaths. Schrœder has also reported fifty ovariotomies done in hospital practice with forty-seven recoveries.

In this country, so far as my observation has extended, the advance has been quite as satisfactory and as marked since the antiseptic method has come into general use, but as yet no operator has placed his experience on record.

Experience has already demonstrated that, with the antiseptic method, we are justified now in undertaking the removal of ovarian tumors at a much earlier stage of their growth. In the greater number of cases from a year to eighteen months can be gained; and many advantages may be claimed in favor of the operation as soon as the tumor rises out of the pelvis. When the tumor can be detected for the first time in the abdomen, as a rule its walls are thin, a single cyst is common, and it is then free from adhesions. Under such circumstances only a small incision is necessary in the abdominal wall, and if the peritoneum is not opened until the oozing has ceased, the sac can be withdrawn without any fluid entering the cavity. The assistant can place his hand on each side as the sac is drawn out, so as to bring the abdominal walls in contact, and thus prevent the entrance of blood while the sutures are being introduced. In such a case I have completed the operation without the introduction of a sponge into the peritoneal cavity.

With these advantages in connection with the antiseptic method, the rule, as to the best period in the growth of the tumor, for its removal, has been reversed, and, as Dr. Keith has stated, ovariotomy is not the operation it was even two years ago.

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